

Phyt. 749^m

AN ESSAY
TOWARDS
GENERAL HISTORY

OF THE
WILLOWS, & OSIERS
THEIR USES
AND
METHODS
OF CULTIVATING THEM.

BY
WILLIAM FORD, ESQ.

OF THE
COUNTY OF DUBLIN.

IN TWO VOLUMES.
THE FIRST OF WHICH
CONTAINS THE HISTORY
AND THE SECOND THE
PRACTICE.

DUBLIN:
PRINTED BY
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1777

SALICES
OR
AN ESSAY
TOWARDS
A GENERAL HISTORY
OF
SALLOWS, WILLOWS, & OSIERS,
THEIR USES,
AND
BEST METHODS
OF
PROPAGATING AND CULTIVATING THEM.

BY
WALTER WADE, ESQ. F.R.S.—M.R.I.A.—L.S.
&c. &c. &c.

HONORARY FELLOW OF THE KING AND QUEEN'S COLLEGE OF PHYSICIANS
IN IRELAND, PROF. AND LECT. ON BOTANY TO THE DUBLIN SOCIETY
AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

" Quid majora sequar ? Salices, humilesque genistæ,
Aut illæ pecori frondem, aut pastoribus umbram
Sufficiunt, sepemque satis, & pabula melli."

GEORG. II.

DUBLIN:

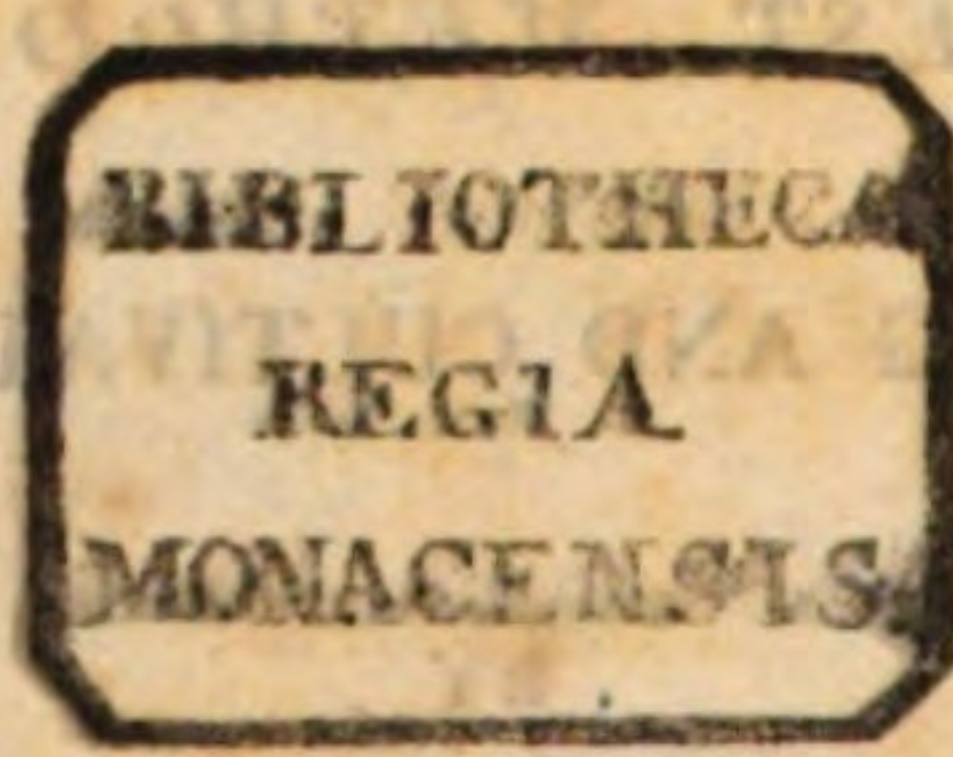
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PRINTERS TO THE RIGHT HON. AND HON. THE
DUBLIN SOCIETY.

1811.

S A L L I C E S
OR
AN ESSAY
TOWARDS
A GENERAL HISTORY

SALICONS, WILLOWS, & OSIERS,
THEIR USES.



WALTER WADDELL, ESQ. F.R.S. &c.
LONDON.
Printed by J. B. Nichols, in Pall-mall.
1817.

DUBLIN:
Printed by G. G. & Co.
1817.

TO THE
RIGHT HONORABLE, AND HONORABLE
THE
MEMBERS
OF THE
DUBLIN SOCIETY.

FROM motives of very high consideration, I have the honor of laying before the Society "AN ESSAY *towards* A GENERAL HISTORY of SALLOWS, WILLOWS, *and* OSIERS"—as a mark of my respect, my duty, and gratitude.

WALTER WADE.

Dublin,
March 1811.

TO THE

HONOURABLE AND HONORABLE

OF THE

MEMBERS

DUBLIN SOCIETY

From motives of every high
consideration I have the honor
of laying before the Society
this volume of a recent history
of railways, with a view
—as a matter of respect to
the Society and its members.

WALTER HARRIS

1845

INTRODUCTION.

THE new, interesting, and correct point of view, in which the *Sallows*, *Willows*, and *Osiers* appear at the present day, by the labours, researches, and observations of Hoffman, Willdenow, and Smith, on the British species in particular, cannot fail to attract the attention and admiration of the scientific botanist, whose knowledge of the subject would be very limited and obscure indeed, were it not for the assistance afforded him by the writings of the luminaries in botanical science just mentioned.

The descriptions and figures of old authors on this subject appear to be very imperfect, obscure and uncouth, and, afford no information whatsoever: and, without wishing to impeach or depreciate such authorities in general, their observations on the *Salix* tribe, at the present day, would be unnecessary, superfluous, and uninteresting to notice.

Indeed Oeder in his *Flora Danica*, Gmelin in his *Flora Siberica*, Pallas in his *Flora Rossica*, Jacquin in his *Flora Austriaca*, the great and immortal Haller in his history of Switzerland Plants, Villars in his *Flora of Dauphiny*, Desfontaines in his *Flora Atlantica*, Scopoli in his *Flora Carniolica*, &c. &c., authors rather of modern date, do not appear, either by their figures or descriptions, to have understood, or conveyed their ideas on the subject in the masterly manner, in which they

are given to us at the present day—their observations however on botany at large, and many objects of Natural history, cannot be too highly rated, or too much admired.

The great master himself—Linnæus, confesses the difficulties he had to surmount in ascertaining, with that precision and chasteness so peculiar to him, the different species of *Salix*.—He, however, with his usual judgment and discriminating turn of mind has left some valuable hints behind him on the subject—hints, which have in a great measure laid the foundation, and led to the discoveries of the real characters of the different species at the present day.

The British Linnæus, the great Swede's admirer and implicit follower, except in a very few instances, has profited by his great master's hints, as will more satisfactorily appear from

the following observations taken from the 6th vol. "*Linnæan Transactions* p. 111." "Some difficulties," says Doctor Smith, "which attend the investigation of the genus *Salix*, are almost peculiar to it." Willows, to be well understood, require to be studied at three different periods of their growth, first, when in flower, at which time the leaves scarcely appear at all; next, when the capsules are fully formed and nearly ripe, and the leaves just expanded, with their stipulæ; lastly, when the leaves have attained their full size, and all the remains of the fructification have disappeared. In this last state the true form, and pubescence or smoothness of the leaves, is to be known; in the second the nature of the *stipulæ*, which frequently are very deciduous, and the figure and surface of the capsules; whereas in the first state the very discriminative and curious parts of the flower, the stamina, nectaria, and above all the proportion and structure of

the germen, style, and stigma, are only to be learnt. I have found, says Doctor Smith, the last mentioned parts so constant and important, so strongly indicative of natural subdivisions of the genus, that, if at all times we could command them, they would certainly afford better scharacter for that purpose than the margin or pubescence of the leaves. But the dioecious nature of these plants is another inconvenience, and peculiarly militates against a general arrangement of them according to parts, which it is an even chance whether we meet with or not, and which are so very transient."

The Flora Britannica of this author gives us a most comprehensive and complete view of *Salices*, their essen-

tial specific differences, and most accurate and unrivalled descriptions at large, and, as it would appear, leaves nothing unsettled on the score of above 45 British species; "it defies imitation, and strikes criticism dumb."

Indeed, take this Flora altogether, it appears to be a masterpiece of laborious research and elegant discrimination, especially on the subject under consideration, and which (except by Hoffman) had been so very imperfectly handled, and understood, before the publication of this Flora.

But how can we too much overrate or admire his observations in English Botany, as a further elucidation of the subject—here many additional and valuable remarks are to

be met with; not absolute corrections of the former in his Flora, (except in a very few instances) but what came under his immediate cognizance subsequently. The plates expressive of the objects by the masterly hand of Mr. Sowerby convey, for the most part, a faithful coloured outline of the plant at large, its catkins, and minute parts of fructification, in a degree of superior botanical excellence not easily to be met with.

This valuable performance, which has now arrived at its 32d volume, exhibiting about 50 British species of Sallows, Willows and Osiers in their natural colours, cannot fail to remove every doubt and obscurity on the subject of Salices, so far as it extends.

Hoffman in his elaborate work, "HISTORIA SALICUM," has likewise taken a most comprehensive view of the subject; and, although it treats but of about 15 species, all British, as well as German, except in one or two instances, must be considered as a preeminent work, and a performance of the first rate value, whether in originality of design, splendour, finished execution, and most minute correctness of the figures to elucidate the objects, drawn by the author himself—the perfect and admirable descriptions, so full, so accurate, and so historical, as far as the work extends, that, at the time we lost sight of it, (1791) nothing appeared to be left undone on the subject by this admirable author. Whether any more of this work, than to the above date, (the first volume and first fasciculus

of the 2d. volume) has been published, the author of this Essay is unacquainted with.

Willdenow in the 4th vol. of his *Species Plantarum* enumerates above 117 species of *Salix*—takes a full and general view of them, as to essential specific differences and descriptions, and, as it appears, has collected his materials from various parts of the world, and the discoveries and communications of many of the most celebrated characters and travellers of the present day, (resources of inestimable value) as *Humboldt and Bonpland, Waldstein and Kitaibel, Link and Hoffmannseg, Michaux, Flügge, Schrank, Starke, Roxburgh, Wulfen, Schrader, Muhlenberg*, in the *New Berlin Acts, &c. &c. &c.*

When noticing the British species of *Salix*, he invariably (except in a very few instances) adopts the nomenclature and descriptions in *Flora Britannica*, although in possession of the plant; so excellent, so correct, and immutable do they appear to the Berlin Professor.

In the highly valuable, laborious, and improved edition of *Miller's Gardener's Dictionary* by Professor Martin, the references, discoveries, and observations of Willdenow and Smith on *Salices* are not to be met with, except such as are mentioned by the latter author on a few British species (12 in number) in the 6th volume of the *Linnæan Transactions*—the cause is evident, the article on *Salices* in this great compilation being printed off before the appearance of

Willdenow's 4th vol. *Species Plantarum* in England, the publication of *Flora Britannica*, or the latter volumes of English Botany, which contain the great majority of British *Salices*.

These accidental circumstances are much to be regretted, as the able Professor would have taken the necessary advantage of their observations, and arranged the subject much more perfectly, and satisfactorily, perhaps, than the humble individual, the author of the present Essay.

Under such circumstances it may be readily anticipated, why the present attempt appears before the public—and first, that part of Doctor Smith's *Flora Britannica*, which treats of *Salices*, has never appeared

in English dress, in any form whatsoever that the author of the present Essay is acquainted with ; he has therefore, besides giving the author's own words from the original, endeavoured to subjoin a faithful translation ; at the same time preserving the purity of the botanical phraseology of the present day, and explaining the terms of the science in as clear, familiar, and intelligible a manner as possible.

Secondly—the English Botany of this author is a work within the purchase of but few, being attended with much expense ; at the present moment (even in numbers) amounting to above 50 British pounds—the author of this Essay has therefore abstracted every circumstance from the different volumes, which could throw any new light, or

give general information on the subject of Sallows, Willows, and Osiers.

Thirdly and lastly—the 2d part of the 4th volume of Willdenow, which includes the Salices, is in the hands of but few, at least in this kingdom—a full and copious abstract from it must therefore be desirable and highly valuable—the author of this Essay has availed himself of doing so, by giving Willdenow's own words from the original, and a translation, in the same way as he has attempted doing from the Flora Britannica of Doctor Smith.

Every exertion has been used, and research made, in order to render the present Essay still more useful, than merely giving the scientific botanical descriptions of the celebrated authors just mentioned, how-

ever valuable and necessary in the first instance, in order to ascertain with certainty the exact character of each species as contrasted with each other.

With this intention then, the properties and value of many of them are noticed, as well as could be ascertained; and the best mode of cultivating and propagating the most useful species, from the best and most modern authorities, is added.

Some assistance in this latter point of view has been afforded by the remarks in Professor Martyn's edition of Miller's Gardener's Dictionary—other resources have been resorted to, and profited by. Much difficulty has occurred in ascertaining with satisfaction, the precise species meant by the vulgar, local, and popular names of

the different common and useful species of Sallows, Willows, and Osiers, as the *red willow*, the *black sallow* and *black withy*, the *Huntingtonshire willow*, the *French osier* &c.; and indeed very little genuine information has been obtained on this head, the various authors being so contradictory and vague. However, such vulgar names as could in any point of view be depended on, or supposed to refer to the different common and useful species, are added*.

* To ascertain the best species of Osiers and the most profitable, easiest, and readiest manner of propagating and cultivating them becomes at this moment, in a very interesting and humane point of view, a most necessary enquiry—from the establishment of the National Richmond Institution, where the poor blind, amongst other employments to which they are supposed adequate, are instructed how to make the different species of basket-work.

Many of the species of *Salix*, mentioned in this Essay, are to be seen growing in the Dublin Society's Botanical Garden, Glasnevin; such are marked *HORTUS GLASNEVINENSIS*, and the numerical added denotes the month of their flowering, or producing their catkins in the garden, as II. February, III. March &c.

The ample opportunities afforded the author, of inspecting them for some seasons back, and watching their progressive developements and process of growth, have enabled him to make a few remarks, which with very great diffidence and hesitation he has added to the elegant and correct observations of the authors already mentioned—they however will appear to be but few, as just observed.

Upon the whole then, this Sketch or Monograph is merely to be considered as a *first* endeavour to bring into one point of view all, that is known of the different species of *Salix* at the present day, including their Habitats or native places of growth, together with their properties, uses, the best mode of propagating and cultivating them &c.—or an Essay *towards* a general History of Sallows, Willows, and Osiers.

Just as this Essay was printed off, the second part of the 10th vol. Linn. Trans. has fallen into the author's hands. The story of the *Salix Babylonica* being raised from a living twig of a fruit-basket, received from Spain by Pope, as noticed at p. 124, appears not to be founded on fact—for in the Linn. Trans. p. 275 we are

told, that Mr. Vernon, Turkey merchant at Aleppo, transplanted the weeping willow (*S. Babylonica*) from the river Euphrates, brought it with him to England, and planted it at his seat at Twickenham park, where it was seen by the late Peter Collinson, Esq. F. R. S. growing in 1748; and this is the original of all the weeping willows in our gardens.

ABBREVIATIONS EXPLAINED;

OR

AUTHORS REFERRED TO.

ANDREWS'S REPOSITORY. The Botanist's Repository for
new and rare plants, by
H. Andrews, London, 1802—
1809, &c. 4to.

ARDUIN. MEM.

Memorie di osservazioni, et di
sperienze sopra la cultura, e
gli usi di varie piante, da P.
Arduino. Padova, 1776, 4to.

BROTERO FL. LUSITANIC. Fel. Avellar Brotero, Flora
Lusitanica. Partes 2.—Olyssipo-
ne, 1804, 8vo.

d

DESFONT. ATL.

Flora Atlantica, auctore Renato Desfontaines. Tomi 2. Parisiis. 4to.

DON. HORT. CANT.

Hortus Cantabrigiensis, by James Donn. Third edition, Cambridge, 1804, 8vo.

EHRH. BEITR.

Beiträge zur Naturkunde und den damit verwandten Wissenschaften von Fried. Ehrhart.—7 Bd. Hannover, 1787—1792, 8vo.

ENG. BOT.

English Botany, by J. E. Smith, the figures by J. Sowerby, London, 1790, seqq. 8vo.

FL. BRIT. SMITH.

Flora Britannica, auctore Jac. Ed. Smith vol. 1—3. Londini, 1800, 1804, 8vo.

FL. DANIC.

Icones plantarum sponte nascentium in regnis Daniae et Norvegiae, editae a Ge. Chr. Oeder, Oth. Frid. Müller, et Mart. Vahl.—Hafniae, 1761, seqq. fol.

- FL. JAPONIC.** C. P. Thunberg *Flora Japonica*, Lipsiæ, 1784. 8vo.
- FL. LAPPON. ED. SMITH.** Linnæi *Flora Lapponica exhibens plantas per Lapponiam crescentes*, ed. alt. Smith. London 1792, 8vo.
- FL. LOND. CURT.** *Flora Londinensis*, by William Curtis, 2 vols. London, 1777, 1798, fol.
- FL. SUECIC.** Linnæi *Flora Suecica, exhibens plantas per regnum Sueciæ crescentes*. ed. 2. 1755, 8vo.
- GMELIN. SIB.** Jo. Ge. Gmelin *Flora Sibirica*. Tomi 4. Petropoli, 1747, 1769. 4to.
- GOUAN. ILLUST.** Ant. Gouan *illustrationes et observationes botanicæ*. Tiguri, 1773, fol.
- HOFFMAN. SAL.** *Historia Salicum iconibus illustrata*, a Georg. Fran. Hoffman. vol. 1. &c. Lips. 1787, &c. fol.

- HORT. KEW. AITON.** Hortus Kewensis, or a Catalogue of the plants cultivated in the Royal Botanic Garden at Kew by William Aiton. vol. III. Lond. 1789. 8vo.
- JACQUIN. AUSTR.** N. I. Jacquin Flora Austriaca. vol. 5. Viennæ, 1773—1778, fol.
- JACQUIN. COLLECT.** Ejusdem Collectanea ad Botanicam, Chemiam et Historiam Naturalem spectantia. vol. 4. et Supplementum. Vindobonæ, 1786—1796, 4to.
- LAUREIRO. COCHIN. ED. WILLD.** Flora Cochinchinensis labore et studio Jo. de Laureiro, denuo in Germania edit. notis C. L. Willdenow. Berol. 1793,—8vo. ejusdem Tomi. 2. Olyssipone, 1790. 8vo.
- LINN. TRANS.** Transactions of the Linnean Society of London.—London 1791, seqq. 4to.
- MICHAUX. AMER.** Andr. Michaux Flora Boreali

Americana. Tomi 2. Parisiis,
1803, 8vo.

MÜHLENBERG NOV. ACT. Mühlenberg. Der Gessellschaft
SCRUT. BEROL. Naturforschender Freunde zu
Berlin Neue Schriften. Berlin,
1795, seqq. 4to.

PALLAS. FL. ROSSIC. Flora Rossica, edidit P. S.
Pallas. Tom. 1. Pars 1. & 2.
Petropoli, 1784, 1788. fol.

ROXBUR. COROMANDEL. Plants of the coast of Coro-
mandel, by Will. Roxburg,
London 1795, fol. max.

SCOPOL. CARNIOL. Jo. Ant. Scopoli Flora Carni-
olica. Tomi 2. Viennæ, 1772.
8vo.

THUNB. PROD. Prodrum plantarum Capen-
sium, quas in Promontorio bo-
næ spei Africes, annis 1772,
1775, collegit C. P. Thunberg.
Partes 2. Upsaliæ, 1794, 1800,
8vo.

VILLARS. DAUPH. Histoire des plantes de Dau-

phiné par M. Villars. Tome
3. Grenoble, 1786, 1789, 8vo.

WANGENH. AMER.

Beytrag sur teutschen holsge-
rechten Forstwissenschaft, die
anpflanzung Nordamericanis-
chen Holzarten mit anwendung
auf Teutsche forste betreffend
von. Fried. Adam. Julius von
Wangenheim. Gotting. 1787.
fol. t. 31,—or a Treatise on the
knowledge of the jurisdiction
of German forests, the plant-
ing of North American trees
in Germany. By Fred. Adam
Julius Wangenheim.

WILLD. ARBORET.

Berlinische Baumzucht. Berlin
1796, 8vo.—or the rearing of
trees according to the methods
practised in Berlin. Auctore
Carol. Lud. Willdenow.

WILLD. SP. PLA.

Car. a Linnè Species planta-
rum, editio quarta, curante C
L. Willdenow, Berolini, 1797,
seqq. 8vo.

WOODVIL. MED. BOT. ED Medical Botany By William
 ALT. Woodville, M. D,—second edi-
 tion. London 1810, 4 vols. 4to.



SALIX

DIOECIA—DIANDRIA.

CHARACTER ESSENTIALIS GENERICUS. *Willdenow.*

♂ *Ament.* oblongum. *Cal.* squama. *Cor.* o. *Stam.*
2, raro 5.

♀ *Ament.* oblongum. *Cal.* squama. *Cor.* o. *Stigm.* 2.
Caps. 2-valvis. *Sem.* papposa.

Essential Generic Character.

♂ Male catkins, oblong. Calyx, a scale. Corolla
none. Stamens two, rarely five.

♀ Female-catkins, calyx, and corolla the same as in
the male. Stigmas two. Capsules or ripe seed-vessels
two-valved. Seeds feathery or downy. Tr.

CHARACTER ESSENTIALIS GENERICUS. *Smith.*

Masc. *Cal.* amenti squama. *Cor.* nulla. *Glandula*
baseos nectarifera. *Stam.* 1—5.

Fœm. *Cal.* amenti squama. *Cor.* nulla. *Stigmata*
duo. *Caps.* supera, unilocularis, bivalvis. *Sem.* pap-
posa.

Essential Generic Character.

Male catkins—Calyx, the squama or scale of the
amentum or catkin. Corolla none. Nectariferous
glands at the base, or bottom. Stamens from 1 to 5.
Female—Calyx and Corolla the same as in the male.
Stigmas two. Capsules or seed-vessels superior, with
one loculamentum, or chamber, for holding the seeds,
and two valves. Seeds pappous. Tr.

SALIX

DIOECIA—DIANDRIA

CHARACTERES ESSENTIALES GENERICI

Willdenow.

- ♂ Arborescens, foliis oppositis, cor. o. 2-ovum.
- ♀ Arborescens, foliis oppositis, cor. o. 2-ovum.
- Caps. 2-valvis, sem. pap. 2.

Essential Generic Characters.

- ♂ Male catkins oblong. Calyx, a scale. Corolla none. Stamens two, rarely five.
- ♀ Female catkins oblong, and corolla the same as in the male. Stigmas two. Capsules or ripe seed-vessels two-valved. Seeds reniform or kidney. Tr.

CHARACTERES ESSENTIALES GENERICI, Swm.

- Arborescens, cor. nulla, glandulae.
- Arborescens, cor. nulla, glandulae.
- Arborescens, cor. nulla, glandulae.
- Arborescens, cor. nulla, glandulae.

Essential Generic Characters.

- Male catkins—Calyx, the epiantha or male of the antherium or catkin. Corolla none. Nectariferous glands at the base of bottom. Stamens from 1 to 5.
- Female—Calyx and Corolla the same as in the male. Stigmas two. Capsules or seed-vessels superior, with one loculamentum, or chamber, for holding the seeds, and two valves. Seeds pap. 2. Tr.

AN ESSAY, &c.

*	<i>Foliis glabris serratis.</i> Leaves smooth and sawed.	} Willdenow.
	<i>Foliis serratis glabriusculis.</i> Leaves sawed, and somewhat smooth.	

I.

SALIX HERMAPHRODITICA, *hermaphrodite*
flowered willow.

Willd. Sp. Pl. v. 4. 653. Fl. Lappon. ed.
Smith. p. 304. Fl. Suecic. p. 345.—Linn.
Trans. v. 6. p. 112.

Descriptio.

CONVENIT cum *S. pendandra* *foliis* glabris obtuse glandulis serratis, convolutis, senis sæpius in singula gemma, flavescentibus. *Amentis* villosis magnitudine et habitu iisdem. *Differt* vero ab eadem *Rami* pallidi rufescentibus, nec purpurascentibus. *Foliorum* pagina superiore venis exaratis, nec venis elevatis ;

Glandulis ad basin petiolorum extuberantibus.
 Tempore prius florendi et gallis copiosioribus,
 quam *S. triandra*. *Willd.* l. c.

Description.

This willow agrees with the sweet, or bay leaved willow (*S. Pentandra*) in having smooth leaves, their serratures blunt with convoluted glands, generally six from each bud, and yellowish; and having villous amenta, or catkins of the same size and form. It differs, in having the branches of a pale brown colour and not tinged with purple; upper surface of the leaves marked with lines, not with elevated veins; the petiolus or leaf stalk is furnished with prominent glands; it flowers earlier and produces a greater crop of galls, than the triandrous willow. (*S. triandra*). *Tr.*

Observations

Doctor Smith observes that this willow has no right to be placed amongst the British plants. The real *hermaphroditica* of the Linnæan Herbarium is closely allied to *pentandra*, except in the fructification, and has never been detected in Britain. All

that Doctor Smith found in the gardens under that name, he considers as merely a broad leaved variety of *pentandra*, the flowers of which are pentandrous and diocious. He observes that the true *hermaphroditica* has but two stamina, and those in the flower with the pistillum. Doctor Smith never saw it in a living state, and he considers it as unknown out of Sweden. *Lin. Trans.* l. c.

In the *Flora Suecica*, it is considered as of very rare occurrence at Upsal; and that it is generally covered with a red coccus (*Coccis rubris*) so small as scarcely visible to the naked eye. *Rolander. Tr.*

II.

SALIX HOPPEANA, Willdenow.—Hoppe's
or Salzburg willow.

Willd. Sp. Pl. v. 4. p. 654.

Character Essentialis Specificus.

Foliis lanceolatis utrinque attenuatis serratis subtus glaucis; amentis coactaneis triandris polygamis, germinibus pedicellatis, oblongo lanceolatis glabris, stigmatibus sessilibus.

Descriptio.

Folia lanceolata acuminata basi attenuata, supra saturate viridia nitida, subtus glauca margine serrata. *Stipulae* semicordatae margine exteriori serratae subtus glaucae. *Amenta* coetanea, superne foeminea, inferne mascula, interdum mere dioica. *Squamae* oblongae obtusae pilosae. *Filamenta* tria, squama parum longiora. *Antherae* subrotundae flavae. *Germen* oblongo-lanceolatum longe pedicellatum glabrum. *Stylus* nullus. *Stigmata* bina emarginata sessilea subpatula. *Differt* a *S. triandra* et *undulata* foliorum forma et colore subtus saturate glauco. *Willd.* l. c.

Essential Specific Character.

Leaves lanceolated, attenuated or thinned on their edges; serrated, glaucous or of a sea green colour, on their under side; the amenta or catkins bursting forth with the leaves, triandrous and polygamous; germens or seed-buds pedicellated or foot-stalked, smooth, and oblongly lance-shaped; stigmas sessile. TR.

Description.

Leaves lance-shaped, acuminate, attenuated at their base, their upper surfaces deep green and shining, underneath glaucous. Stipules semicordate or half-heart-shaped, their exterior margin serrated, underneath glaucous. Amenta or catkins springing forth with the leaves, the upper ones feminine, the lower males, sometimes merely dioecious. The squamæ, scales, or calixes, oblong, obtuse, and hairy. Three stamina, a little longer than the squama or scale. Antheræ yellow and somewhat round. Germen or seed-bud oblong lance-shaped, smooth, and with a long footstalk. No style. The stigmas by twos, emarginated, sessile and somewhat spreading. It differs from the long leaved triandrous willow (*S. triandra*,) and waved willow (*S. undulata*,) in the form of the leaves, and their deep sea green colour on the under surface. TR.

Willdenow states that it grows near Salzburg, and he examined it in its dry state only.

III.

SALIX TRIANDRA, long leaved triandrous
willow, smooth willow, almond
leaved willow, round eared
shining willow.

Willd. Sp. Pl. v. 4. 654. Hoffman. Sal. v. 1.
45. t. 9. 10. & t. 23. f. 2. Pallas Rossic. 1. 78. Fl.
Lond. Curt. 2. t. 372. Trans. Linn. Soc. v. 6.
118. Fl. Brit. Smith v. 3. 1044. Eng. Bot. v.
20. t. 1435. Gmelin. Sib. v. 1. 155. t. 34.
f. 3.

HORTUS GLASNEVINENSIS. III. VIII.

Charac. Ess. Specificus. W.

Foliis lanceolatis acuminatis basi obtusis
serratis subtus glaucescentibus, amentis co-
aetaneis triandris, germinibus pedicellatis ob-
longis tuberculatis glabris, stigmatibus sessili-
bus. *Willd. l. c.*

Descriptio. W. W.

Arbor 30 pedalis corticem ut platanus
quotannis abjiciens. *Stamina* squama duplo
longiora. *Willd. l. c.*

Essential Specific Character.

Leaves lanceolate, acuminate, and obtuse at their base, serrated, underneath rather of a sea green colour; catkins appearing with the leaves and three-stamened; germen, or seed bud footstalked, oblong, smooth and covered with tubercles; stigmas sessile. TR.

Description.

A tree of thirty feet high, casting off its bark like the plane tree. The stamina twice as long as the scale. TR.

Willdenow saw it in a living state, and observes that it is to be found in Switzerland, Siberia, Germany, &c.

Charac. Ess. Spec. SM.

S. triandra, foliis lineari-oblongis serratis glabris, germinibus pedicellatis. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor 30 pedalis. Cortex caudicis et ramorum deciduus, fere ut in Platano. Ramuli

erecti longi, viminei, tenaces, fuscescentes, glabri, ad genicula subfragiles. Folia petiolata triuncialia, lineari-oblonga, basi angustata, lateribus æqualibus, acuminata, crebrè serrata, serraturis inflexo-rotundatis, subglandulosis, utrinque glaberrima; suprà lætè viridia; subtus glaucescentia. Stipulæ ovato-obliquæ, crenatæ, venosæ, glabræ, sæpè nullæ. Amenta ramulos novellos terminantia, erecta, cylindracea, gracilia, flavicantia, squamis villosis, obtusis. Nectarium obtusum. Stamina plerumque tria, rarissime in eodem amento bina. Antheræ flavæ. Germen pedicellatum, ovatum, acuminatum, tuberculatum. Stigmata brevia, patentia, emarginata. Capsula glaberrima, virens. *Smith Fl. Brit. l. c.*

Essent Spec. Charact.

A willow with 3 stamina, leaves linear oblong, serrated, smooth, seed buds footstalked. *Fl. Brit. l. c.* TR.

Description.

A tree 30 feet high. The bark of the trunk and branches deciduous, or spontaneously throwing itself off, nearly in the same way as in the plane tree (*Platanus*.) The

small boughs straight, long, slender, tough, brownish, smooth, and rather fragile at their joints or insertions. Leaves petiolated or with footstalks, three inches long, oblongly linear, narrowed at their base, their sides equal, acuminate, thickly serrated, the serratures inflected and rounded off, somewhat glandular, very smooth on both sides, upper one of a pleasant green colour, underneath rather sea-green. Stipules obliquely ovate, crenated, veined, frequently no stipules. Catkins terminating the young branches, erect, cylindrical, slender, yellowish, squamæ or calyx scales downy, and obtuse. Nectarium obtuse: Stamina most generally three, very rarely two in the same catkin. Antheræ yellow. Germen or seed-bud supported by a foot-stalk, ovate, acuminate, and tuberculated. Stigmas short, spreading and emarginate. Capsule or seed-vessel green, and very smooth. TR.

Observations.

It appears to be amongst the most valuable of the oziers. Doctor Smith (Fl. Brit. l. c.) observes that it is frequently to be met with in osieries, and on the banks of rivers, flowering or producing its catkins in May, and again in August.

When undisturbed, this species grows to a large tree, and is common in wet woods and hedges; but being an excellent ozier, it is generally treated as such, and cut down every year. It produces tough, pliable, and lasting rods 8 or 9 feet long, and its several varieties (which differ in the darkness or straightness of the leaf, and in fecundity of growth) are all valued by basket-makers. *Eng. Bot. l. c.*

Mr. Curtis remarks that the leaves are more strongly serrate than most others; that the branches in autumn are usually furnished with stipules, but not always; and that towards the top they are angular or grooved in a greater degree than any other willow he has examined.

He observes that this species may be admitted into ornamental plantations, the male catkins being very numerous, of a bright yellow colour, and of an agreeable scent. The male tree should on this account be preferred for ornament; and also because the females quickly shed their catkins and make a litter.

Hoffman (l. c.) states that the bark of this willow is lightly astringent and bitterish—that a watery decoction of it, is of a brownish yellow colour, bitter, and strikes a black with

the addition of sulphat of iron. He experienced very good effects from it in tertian ague. In the 5th volume of the Medical Commentaries, the bark, in doses of one or two drams, is stated as having cured agues. TR.

In the situation I have mentioned (the Dublin Society's Botanical Garden, Glasnevin) this willow protrudes its male catkins in March and again in August, and which are remarkably slender, very numerous, light yellow, and rather pyramidal—each flower is furnished with 3 erect filiform stamina twice as long as the scales—the squamæ or calyx scales are concave, rounded, scaly, hairy, of a greenish yellow colour, and finely sawed—the nectarium small and broad.

The female catkins are likewise very slender, and long, alternate, the scales whiteish or rather very pale yellow, and obtuse, and half as long as the germen.—The germen or seed-bud with a long footstalk, grooved, and very green—the stigmas bifid, the nectarium very small, and placed at the base of the footstalk of the germen.

The branches are remarkably scored, and furnished with abundant subrotund, or rather semicordate stipules.

IV.

SALIX UNDULATA, *undulated, or waved*
willow.

Willd. Sp. Pl. v. 4. p. 655. Ehrharts.
(Arb. 108.)

Charact. Ess. Specif. w.

Foliis lanceolatis acuminatis basi obtusis
argute undulato-serratis, amentis *coaetaneis*
triandris, germinibus pedicellatis oblongo-lan-
ceolatis pubescentibus, stylis elongatis. Willd.
l. c.

Essent. Specif. Charact. w.

Leaves lanceolated, acuminate, and ob-
tuse at their base, sharply waved, serrated;
catkins appearing with the leaves, three
stamined; germen or seed-bud pedicellated,
of an oblong lance-shaped form, pubescent,
with an elongated style. TR.

Willdenow examined it in a living state.
It grows on the banks of rivers in Ger-
many.

V.

SALIX VILLARSIANA, *Villarsian willow*.

Willd. Sp. Pl. v. 4. p. 655.

Descriptio. W.

Frutex 5. s. 6 pedalis, ramis nigro-violaceis nitidis. *Folia* pollicaria vel sesquipollicaria rigida, supra saturate viridia nitida, subtus nivea glabra elliptica acuminata basi subrotunda æqualia margine argute serrata. *Stipulae* magnæ, semicordatæ obtusæ dentatæ. *Willd.*
l. c.

Description.

A shrub of 5 or 6 feet high; branches of a blackish violet colour, and shining. Leaves form an inch to an inch and a half long, stiff; their upper surface of a deep green colour, underneath snowy, smooth, elliptically acuminate, somewhat rounded at their base, sharply serrated on their edges. Stipules large, half-hearts-haped, obtuse and dentated. *Tr.*

Willdenow examined it in its dry state only. A native of the South of France. TR.

VI.

SALIX AMYGDALINA, *broad-leaved triandrous willow, almond-leaved willow.*

Willd. Sp. Pl. v. 4. p. 656. Trans. Linn. Soc. v. 6. p. 119. Flor. Brit. Smith. v. 3. p. 1045. Eng. Bot. v. 27. t. 1936.

HORTUS GLASNEVINENSIS. III. VIII.

Charact. Ess. Specif. SM.

Triandra, foliis ovatis obliquis serratis glabris, germinibus pedicellatis, stipulis maximis. *Fl. Brit. l. c.*

Descriptio. SM.

Nunquam arborescit. Cortex deciduus. Rami patentiusculi, glabri, lutescentes, fragiles. Folia petiolata, fere biuncialia, latè ovata, basi rotundata, obliqua, sive lateribus inæqualibus, acuminata, undique serrata, serraturis inflexis, utrinque glaberrima; suprà

lætè viridia, subtus glauca. Stipulæ maximæ figurâ variæ, rotundatæ, sive semicordatæ, crenatæ, deciduæ. Flores (ex D. Crowe) triandri. Amenta fœminea crassiora quam *S. triandra*, squamis glabris, capsulis pedicellatis glaberrimis.

Figura foliorum a *S. triandra* satis differt, ex observationibus Dom. Crowe. *Sm. Fl. Brit. l. c.*

Ess. Specif. Charact.

Three stamen'd, leaves ovate, oblique, serrated, smooth, seed-buds footstalked, stipules very large. *Fl. Brit. l. c.*

Description.

This willow never assumes an arborescent form. Bark deciduous. Branches somewhat spreading, smooth, yellowish and fragil. Leaves with footstalks, nearly two inches long, broadly ovate, and rounded off at their base, oblique, or rather their sides are unequal, acuminate, serrated, the serratures inflected, very smooth on both surfaces, upper one of a lively green, underneath a sea-green colour. Stipules very large, of various forms, rounded, semicordate, crenated, and deciduous. Flowers

on the authority of Mr. Crowe furnished with three stamina. Female catkins much thicker than those of the long-leaved triandrous willow (*S. triandra*.) Scales smooth, capsules or seed-vessels very smooth, and furnished with foot-stalks.

The figure of the leaves sufficiently discriminates it from *S. triandra*, according to the observations of Mr. Crowe. TR.

Observations.

Doctor Smith (l. c.) states that it is to be met with in osier grounds, but not common, being a bad osier, and that it flowers in April and May.

In his English Botany (l. c.) we are informed that it is to be found about the banks of rivers and ditches in various parts of Britain, and that he had it from Sussex and Norfolk. In the latter country he observes it is esteemed much inferior, as an osier, to *S. triandra*, but that a Mr. Wolgar of Lewes mentions it as valued and long cultivated thereabouts, producing a good crop of rods 6 or 8 feet long for many successive years.

Though this species is less arboreous than *triandra*, it will, if allowed to grow, form a small and handsome tree, casting the bark in autumn, flowering again in August. It is characterized by remarkably furrowed young branches; large rounded crenate stipules, which however vary in dimensions; and broad oblique leaves, rounded at the base, not sloped off as in *triandra*. The catkins terminate small lateral branches, and are cylindrical, with rounded, slightly, hairy scales; the barren flowers are yellow, with three stamens; fertile ones greener. Capsule stalked, ovate, compressed, smooth.

The female catkins appear at the same time as those of *S. triandra* remarkably different in appearance, are much thicker and broader, oblong, and green. The squamæ very long, doubly so as in *S. triandria*, broad, pale-yellow, and concave—germen with a long footstalk, compressed and grooved—the nectarium exceedingly small. *Wade.*

VII.

SALIX RUSSELIANA, *Bedford willow*. *Leicestershire*, or *Dishley willow*. *Huntingtonshire willow*?

Willden. Sp. Pl. v. 4. 656. Fl. Brit. Smith. 3. 1045. Eng. Bot. v. 26. t. 1808.

HORTUS GLASNEVINENSIS. IV. VII.

Charact. Ess. Specif. W.

Foliis lanceolatis acuminatis serratis glabris amentis coetaneis triandris germinibus pedicellatis subulatis lævibus, stylis elongatis. *Willd. l. c.*

Ess. Spec. Character.

Leaves lanceolated, acuminate, smooth; catkins and leaves appearing at the same time, three stamened, germens or seed-buds awl-shaped, smooth, footstalked; styles elongated. *TR.*

Charac. Ess. Specif. SM.

Triandra? foliis lanceolatis acuminatis serratis glabris, germinibus pedicellatis subulatis lævibus. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor excelsa, vegetissima, sub S. fragili adhuc, ni fallor, confusa. Rami nitidi, tenacissimi, et valde flexiles. Folia lanceolata, elongata, acuminata, glabra, nitida, undique serrata, subtus glaucescentia. Stipulæ exiguæ, semicordatæ, dentatæ. Amenta mascula nondum vidi; foeminea laxa, rachitomentosa, squamis linearibus, pilosis, deciduis. Nectarium obtusissimum, apice croceum. Germen brevius pedicellatum, ovato-subulatum, læve. Stylus parum elongatus, crassus. Stigmata bipartita. *Fl. Brit. l. c.*

Cortex ad rem coriariam omnium præstantissimus; D. Biggin. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Triandrous? Leaves lance-shaped, pointed, sawed, smooth, seed-buds footstalked, awl-shaped, bare. *Fl. Brit. l. c.*

Leaves lanceolate, tapering at each end, serrated throughout, very smooth, footstalks glandular. Germen, tapering, stalked, longer than the scales. *E. Bot.*

Description.

A tall flourishing tree, hitherto (unless Doctor Smith is mistaken) taken for the crack willow (*S. Fragilis.*) Branches shining, very tough and flexible. Leaves lanceolated, elongated, acuminate, smooth, shining, serrated on each edge, underneath somewhat of a sea-green colour. Stipules very smooth, half-heart-shaped, and dentated. Male catkins Doctor Smith never saw. Females with a tomentous or woolly rachis; scales linear, pilous or hairy, deciduous. Nectarium very obtuse, and of a saffron colour at its apex. Germen or seed-bud with a short footstalk, egg-lance shaped, smooth.

Style a little elongated, and thick. Stigmas cloven. *T.*

Observations.

The bark of this willow is much more esteemed for the use of the tanner, than any of the other species. *Mr. Biggin. TR.*

Doctor Smith Fl. Brit. l. c. states that it is to be met with in osieries and marshy situations flowering in April and May. *TR.*

Communicated by his Grace John Duke of Bedford, who, with his late illustrious brother, has paid much attention to the cultivation and uses of this hitherto non-descript species.

Great disputes have arisen respecting this willow since the late Duke of Bedford first brought it into notice for its tall quick growth and valuable properties; and the late Mr. Biggins, under his Grace's patronage, ascertained its bark to be peculiarly good for tanning. The present Duke has also paid much attention to it. Doctor Smith is obliged to him for living plants, and some remarks concerning the differences of opinion above alluded to. It was first made known by the name of the Leicestershire or Dishley willow, being supposed peculiar to that neighbourhood; but it is found throughout the midland and southern counties, being in fact what is taken often for *S. fragilis*, by which name it was known to many cultivators, who had not discovered its merits, and who, when those merits were published, made light of them because they already knew the plant. The excellent author of the *Bedford Flora* was one of the first botanists, who ascertained these species to be distinct.

The whole hue of *S. Russelliana* is lighter than that of *fragilis*, especially the leaves, which are also more firm, and narrower, tapering at the base, and not rounded, or ovate; their serratures are more coarse and irregular; mid-rib much stouter. The glands of the footstalks sometimes become leaflets. Germen longer than the scale, more tapering and awl-shaped than *fragilis*, with a longer stalk and style. The male plant Doctor Smith, as I observed before, never saw. *Eng. Bot. l. c.*

The branches are black—dentations on the leaves distant, and their mid-rib reddish brown. Female catkins very long, slender, greenish yellow. Squamæ imbricated, ciliated, very long, greenish yellow. Germen slender, grooved, compressed, footstalked, and green. Stigmas bifid, and revolute. Nectarium very small and truncated, placed at the base of the footstalk of the germen. The squama and germen are of the same length. *Wade.*

VIII.

SALIX HUMBOLDTIANA, Willdenow. Humboldt's * willow.

Willdenow Sp. Pl. v. 4. p. 657.

Charact. Ess. Specif.

Foliis linearibus acuminatis serrulatis glabris; amentis serotinis polyandris, germinibus pedicellatis glabris.

* The expedition of Humboldt and Bonpland contains in it every kind of merit. Humboldt has executed, at his own expense, an enterprise that would have done honor to a nation. Accompanied by his friend Bonpland, he has plunged into the American wilderness—he has brought back with him 6000 species of plants—has determined the position of 600 points by astronomical observation—has ascended to the top, and measured the height of Chimboracco. He has created the geography of plants—assigned the limits of vegetation and of eternal snow—observed the phenomena of the magnetic needle, and of electric fish; and has presented the lovers of antiquity with much valuable information concerning the Mexicans, their language, their history and monuments.

Descriptio.

Rami fusci nitidi. *Folia* linearia quadri-pollicaria et longiora, binas lineas lata, acuminata serrulata, utrinque glabra, et viridia, iis *S. longifoliae* proxima. *Stipulae* parvae subrotundae, dentatae. *Amenta* faeminea serotina. *Germina* oblonga glabra pedicellata. *Stigmata* sessilia. *Willd. l. c.*

Humboldt has published, separately from the journal of his travels, all that relates to astronomy, geognosy, zoology, and botany; as to the last he has first published an Essay towards a system of geography of plants, together with a physical picture of tropical countries, founded on observations and measurements, made from 10° S. L. as far as 10° N. L. from the years 1799 to 1803 inclusive. The second work is his “*Plantæ Æquinotiales, per regnum Mexici, in Provinciis Carraccarum et Novæ Andalusiae, in Peruvianorum, Quitensium, Novæ Granadæ Andibus, ad Oronoci, Fluvii Nigri, Fluminis Amazonum, ripas nascentes. In ordinem digessit A Bonpland.*” In folio, cum figuris a Sellier incis. The history of the tropical grasses and cryptogamous plants follows with the necessary plates. Besides many new genera, an immense number of non descript species of known genera, such as *Lobelia*, *Melastoma*, *Psychotria*, *Quercus*, *Passiflora*, *Mimosa*, &c. are noticed.

Ess. Specif. Charact.

Leaves linear, acuminate, finely serrated, smooth; catkins appearing late, after the unfolding of the leaves polyandrous, or furnished with many stamina; germens or seed-buds footstalked and smooth. TR.

Description.

Branches brown and shining. Leaves linear, above four inches long, by two lines broad, acuminate, finely sawed, smooth and green on both sides, very like those of *S. longifolia*. Stipules small, somewhat round, and dentated. Female catkins appearing late. Germen or seed-buds oblong, smooth, and footstalked. Stigmas sessile. TR.

Willdenow examined it in a dry state, and he tells us that Humboldt and Bonpland found it in Peru, and cultivated in the warmer parts of America.

IX.

SALIX LANCEOLATA, *sharp-leaved triandrous willow.*

Eng. Bot. v. 20. t. 1436. Ehrh. Arb?
108. *S. undulata.*

HORTUS GLASNEVINENSIS.

Essential Specific Character.

Stamina three. Leaves lanceolate, tapering towards each end, serrated, smooth. Foot-stalks decurrent. Germen on a foot-stalk.
Eng. Bot.

This is one of the willows omitted in Smith's *Flora Britannica* for want of sufficient observations at that time to determine it as a species. It has long been known to Mr. Crowe, and is perhaps not uncommon. Doctor Smith received specimens, gathered wild in Sussex from Mr. Woolgar of Lewes, accompanied with many intelligent remarks upon this species, as well as several varieties as

they appeared to Doctor Smith of *S. triandra*, and some others.

This grows to a small tree, casting its bark like the *triandra*, and flowering in April and May. It is easily distinguishable by its much longer, more pointed and tapering leaves, as well as stipulæ, and particularly by the base of the footstalk running down remarkably along the branch. The leaves have often a small pair of leaflets at their base. The germen is more constricted and pointed than in *S. triandra*, but in other respects the parts of fructification nearly accord.

Basket-makers, as Mr. Woolgar informs Doctor Smith, know this well from *S. triandra*, and do not esteem it so much, as the rods when peeled are apt to split in working; but they are very good for brown hampers, crates, &c.

This is very near Ehrharts *S. undulata*, (Willd. 4. p. 655.) noticed before, but his leaves are more rounded at the base, nor do we see how the name applies to our plant. *Eng. Bot. l. c.*

X.

SALIX DECIPIENS, *white Welch, or
varnished willow.*

Hoffman. Sal. v. 2. 9. t. 31. Eng. Bot.
v. 27. t. 1937.

HORTUS GLASNEVINENSIS.

Essential Specific Character.

Leaves lanceolate, serrated, very smooth. Footstalks somewhat glandular. Germen tapering, stalked. Floral leaves dilated and bluntish. Branches smooth and highly polished. *Eng. Bot.*

Observed wild by Mr. T. F. Forster near Tunbridge; in Northumberland and Durham by Mr. Winch; by Mr. Woolgar in many moist hedges round Lewes, and by the late Mr. Crowe in a cultivated state, by the name of the white Welch osier, in several osier grounds in Norfolk and Cambridgeshire. Mr. Woolgar says "it produces good rods for basket-work, but in a few years, about Lewes at least, the shoots are so short as not to be worth cultivating."

This forms a small tree of handsome growth, flowering in May. It is readily known by the very smooth shining bark of its last year's shoots, which is of a light reddish brown, or clay colour, appearing as if varnished. The young twigs are often stained beautifully with crimson. Leaves very much akin to those of *S. Russelliana*, but mostly smaller; and those borne on the short flowering branches of *S. decipiens* are remarkably different from *Russelliana*, being obtuse, nearly obovate, and recurved, except only the upper one. Stamens 2 very rarely 3. Nectary in the male double. Germen stalked, tapering, smooth. Scales all elliptic oblong, hairy.

Decipiens is but a bad name, and Hoffman's account, though very correct, incomplete. Roth in his German Flora, v. 2. 506, merely copies it. Doctor Smith compared authentic specimens. *Eng. Bot. l. c.*

Hoffmann has named this *decipiens*, because it resembles another species so much, that an incurious observer might easily be deceived in taking them for the same.

XI.

SALIX TETRASPERMA, *Four-seeded willow.*

Willd. v. 4. 657. Roxburg. Coromandel. *
v. 1. p. 66. t. 97.

Descriptio. W.

Arbor mediocris. *Folia* bi-vel 4 pollicaria oblongo-lanceolata apicè attenuata margine serrata glabra, subtus glauca. *Amenta* mascula tripollicaria. *Squamæ* oblonge obtusæ. *Stamina* 6 ad 8 reflexa. *Amenta* foeminea

* Plants of the Coast of Coromandel selected from drawings and descriptions presented to the Honourable Court of Directors of the East India Company, published by their order, under the direction of Sir Jos. Banks, Bart. A work, the honor of which is mutually shared by Doctor W. Roxburgh, the munificent company that patronized him, and the celebrated character under whose direction it appears. Of this Flora, it may be said, that there is no botanical work extant, which with so much eloquence and utility unites such comparative cheapness, at least the uncoloured copies.

sesqui v. pollicaria. *Germen* longissime pedicellatum, ovatum, glabrum. *Stylus* mediocris. *Stigmata* bina. *Capsulae* tetraspermæ. Willd. l. c.

Description.

A tree of a middling size. Leaves from 2 to 4 inches long, oblong lance-shaped, attenuated at their apex, serrated, smooth, underneath of a sea-green colour. Male catkins three inches long. Squamæ or scales oblongly obtuse. Stamina from 6 to 8, reflected or bent back. Female catkins from an inch to an inch and a half long. *Germen* or seed-bud supported by a very long footstalk, ovate and smooth. Style of a middling size. Stigmas by twos. Capsules, or seed-vessels with four seeds. TR.

In mountainous situations on the banks of rivers in the East Indies. Willd. l. c.

Description. ROXB.

Trunk erect. Head large, very ramous. Branches twiggy. Leaves alternate, short, petiolated, broad-lanced, fine-pointed, most minutely sawed, above smooth, below whitish, from 2 to 4 inches long. Male ament

filiform; its peduncle often leaf-bearing, issuing from the dry, smooth, brown involucre like scales of the bud. Perianth proper, small, cup-form with a long depending tongue like lip. Filaments 6 to 8 retrofracted, 3 or 4 times longer than the tongue of the perianth. Anthers twin, orbicular and grooved. Female aments shorter than the male. Perianth the same. Germ long pedicel'd. Style length of the capsule. Stigmas two spreading. Capsule heart-shaped, opening from the apex, one-cell'd, 4-seeded, oblong, involved in a fine white cotton, which does not adhere to them, but is inserted with them into the bottom of the capsule. *Roxburg. Coromandel. L. c.*

Observations.

This is the only species of *Salix* Doctor Roxburgh found in India. It is a middle sized tree, a native of the banks of rivulets and moist places; far among the mountains. Flowers in the cold season.

XII.

SALIX NIGRA, *black American willow*.

Willd. Sp. Pl. 4. 657. Muhlenb. * Nov.
Act. Soc. Nat. Scrut. Berol. 4. 237. t. 4. f. 5.

Charact. Ess. Specif.

Foliis lanceolatis acuminatis serratis glabris, petiolis pubescentibus, amentis *coetaneis* tetrandris, germinibus pedicellatis subulatis glabris. *Wild. l. c.*

* The Rev. Mr. Muhlenberg has communicated his observations on some of the numerous species of willow he found in the neighbourhood of Lancaster in Pennsylvania, in the New Berlin Acts.

The description of the willows of North America by the Rev. Mr. Muhlenberg is a valuable contribution towards the better knowledge of this genus; for it is observed that of all the species of America we know but one through Mr. Von Wangenheim, and another through Mr. Aiton. All that is found respecting them in the works of Clayton, Gronovius, and Walter is too short, and too vague to deserve notice.

Description.

Arbor 20 pedalis, ramis atro-purpureis. *Folia* angustata lanceolata bipollicaria et longiora, utrinque glabra, viridia, supra nitida, acuminata, argute serrata, serraturis inferioribus subglandulosis, breve petiolata. *Petiol*i pubescentes. *Stipulae* parvae subrotundae, acutae, serratae. *Amenta* coetanea, mascula, sesquipollicaria. *Squamae* oblongae, obtusae, pilosae. *Stamina* 3, 4, 5. 6. *Amenta* foeminea pollicaria erecta. *Squamae* oblongae, obtusae, cano-pubescentes. *Germen* oblongo-subulatum glabrum. *Stylus* brevis. *Stigmata* bina. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lanceolated, acuminate, serrated, smooth; leaf-stalks pubescent; catkins appearing with the leaves, four stamened; germen or seed-bud, footstalked, awl-shaped, and smooth. *Tr.*

Description.

A tree of 20 feet high, branches of a blackish purple colour, leaves narrowed,

lance-shaped, about two inches long, smooth on both sides, green and shining on their upper surface, acuminate, sharply and neatly serrated, inferior serratures somewhat furnished with glands, and shortly footstalked. Leaf-stalks pubescent. Stipules small, somewhat rounded, acute, and serrated. Catkins coming forth with the leaves, male an inch and a half long. Scales oblong, obtuse, hairy. Stamina, 3, 4, 5, or 6. Female catkins erect, an inch long, scales oblong, obtuse, pubescent with a fine hoar; germen oblong, awl-shaped, smooth; style short; stigmas binary.

Willdenow examined the male catkin in its recent state; the female in its dry state. It is to be met with near rivers in Pennsylvania, Carolina and Georgia. TR.

XIII.

SALIX PENTANDRA, *sweet willow*, *bay-leaved willow*.

Willd. Sp. Pl. 4. 658. Fl. Lapp. ed. Smith. p. 303. t. 8. f. z. Gmelin. Fl. Sibir. 1. p. 153. t. 34. f. 1. Fl. Dan. t. 943. Trans. Linn. Soc. v. 6. 120. Fl. Brit. Sm. v. 3. 1046. Eng. Bot. v. 26. t. 1805.

HORTUS GLASNEVINENSIS. v. VI.

Charact. Ess. Specific. w.

Foliis ellipticis acuminatis serratis glabris petiolis superne glandulosis, amentis serotinis pentandris, germinibus lanceolatis glabris. Variat staminibus 4, 5, 6, 7, *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptic, acuminate, serrated, smooth, the upper part of the leaf-stalk furnished with glands ; catkins appearing late, after the developement of the leaves and pentandrous ;

germens or seed-buds lanceolated and smooth. The male catkins vary with from 4 to 5, 6, and 7 stamina.

Willdenow examined it in a recent state, and he observes that it grows all over Europe in mountainous marshes. *Willd. l. c.*

Charac. Ess. Specif. SM.

Pentandra, foliis elliptico-lanceolatis crenulatis glabris, germinibus glabris sessilibus. *Fl. Brit. l. c.*

Descriptio. SM.

Rami læves, nitidi. Folia brevius petiolata, elliptico-lanceolata, seu late ovata, acuminata, crenulata, crenulis glandulosis, resinâ flavâ odoratâ scatentibus, utrinque læte viridia, nitida glaberrima. Stipulæ vix ullæ. Amenta ramulos terminantia, solitaria, subnutantia, cylindrica, crassiuscula, obtusa, flava, odorata, rachi villosa. Squamæ rotundatæ, basi villosæ. Stamina circiter quinque, basi hirsuta. Germen subsessile lanceolatum, glabrum, nitidum. Stigmata patentia subrecurva, emarginata. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

Five-stamened, leaves elliptically lance-shaped, notched, smooth; seed-buds smooth, half sessile. *Fl. Brit. l. c.* TR.

Stamina five or more. Leaves elliptic-lanceolate or ovate, pointed, crenate, glandular, smooth; Germens smooth, nearly sessile. *Eng. Bot.*

Description.

Branches smooth and shining. Leaves with short footstalks, elliptically lance-shaped, or rather broadly ovate, acuminate, and delicately crenate or notched, the notches furnished with glands which afford an odoriferous yellowish resin; of a pleasant green on both surfaces, shining and very smooth. Scarcely any stipules. Catkins terminating the branches, solitary, and somewhat bending downwards, cylindrical, rather thick, obtuse, yellow, sweet-smelling, and the rachis villous. Squamæ, or scales rounded off, and shaggy at their base. About 5 stamina, which are hairy at their base. Germen or seed-bud, rather sessile, lance-shaped, smooth, and shining. Stigmas spreading, subrecurved, or a little bent back, and emarginated or notched. TR.

Observations.

Doctor Smith (Fl. Brit. l. c.) informs us that it grows near rivers in the north of England, and south of Scotland. Common in Westmoreland and the mountainous parts of the lowlands of Scotland—flowering in May and June.

And again he observes, (Eng. Bot. l. c.) that the *S. pentandra* is one of the species most familiar to botanists. It grows about rivers in the north of England and south of Scotland as before observed; flowering in June and July, and forming a handsome small tree. The leaves are broad and ovate when in perfection, smooth and shining, pointed, closely crenate rather than serrate, with a yellow fragrant gland at each notch, causing the bay-link-scent for which the plant is valued. Foot-stalk glandular. Stipules scarcely any. Male catkins yellow, fragrant and handsome. Stamens in a cultivated state from 6 to 9, hairy as are the scales. Female catkins with hairy scales, but smooth lanceolate germens. Style shortish. Stigmas cloven. This tree is chiefly cultivated for ornament. *S. hexandra*, of Ehrhart is very different, having narrow leaves.

Linnaeus informs us that the wood crackles greatly in the fire. The branches are cut to make springles—sheep and goats eat it—and the leaves afford a yellow die—those circumstances are corroborated by Doctor Stokes of England.

Mr. Curtis says it is much used in Yorkshire for making the larger sort of baskets.

The great Haller in his admirable History of Switzerland plants, v. 2. p. 304. art. 1639.—tells us that the down of the seeds may be used for a variety of purposes in the place of cotton, but if mixed with a third part of the latter so much the better, and in its recent state. It makes excellent wicks for candles.

According to Mr. Gough, as noticed in Withering's Arrangement of British Plants, there are 11 leaves on the barren or stamen bearing, and 6 or 8 on the fertile shoots; the 2 lower leaves comparatively small and inversely egg-shaped. Nectaries often wanting in the flowers at the extremities of the catkins, in the room of which there are three additional perfect stamens.

The leaves are alternate and ascending—old branches black, young ones green—stipules small and notched, glands very conspicuous on the petioli or leaf-stalks of the female tree. Female catkins few, long, and generally pendant squamæ or calyx scales long, ligulated, and ciliated. Germen, or seed-bud footstalked, slender and straight. Stigmas revolute. Nectaria very small, truncated, and notched. *Wade.*

The male tree appears to be not near so large as the female in any of its parts—very few resinous glands on the margin of the leaves—catkins many. Squamæ hairy, rounded, pale green, before the complete expansion of the little flower crenated, afterwards not so. Stamens 5, 6, and 7, slender and in a verticillus or whorl. Nectaria 2, 3, and 4, very small, shining, verticillated and yellow. *Wade.*

XV.

SALIX NIGRICANS, *dark broad-leaved*
willow.

Willd. Sp. Pl. v. 4. 659. Fl. Lapp. Smith.
291. t. 8. f. c. n. 350. Trans. Linn. Soc. v.
6. 120. o. Fl. Brit. Sm. v. 3. 1047. Eng.
Bot. v. 17. t. 1213.

Charac. Ess. Specif. w.

Foliis ellipticis utrinque acutis glabris remote serratis subtus glaucis, amentis praecocibus, capsulis pedicellatis lanceolatis acuminatis sericeis. *Willd. l. c.*

Ess. Specif. Character.

Leaves elliptic, acute on both sides, smooth, remotely serrated, underneath of a sea-green colour; catkins appearing very early before the least appearance of leaves, capsules or seed-vessels footstalked, lance-shaped, acuminate, silky. TR.

Willdenow examined this willow in a dry state, and he observes that it grows in osieries in England, and in Lapland. TR.

Charact. Ess. Specif. SM.

Foliis elliptico-lanceolatis crenatis glabris subtus glaucis, germinibus pedicellatis lanceolatis sericeis. *Fl. Brit. l. c.*

Descriptio. SM.

Vix arborescit. Rami rectiusculi, teretes fragiliores, cortice nigricanti, glabro. Folia bi-vel tri-uncialia, elliptico-lanceolata, acuta, basi parum rotundata, undique ferè crenata; supra saturatè viridia, glaberrima, exsiccatione nigricantia; subtus glauca, venosa, interdum pilosiuscula. Petioli basi dilatati. Stipulae, si adsint, majusculae, obliquè cordatae, serratae, glabrae. Amenta uncialia vel sesquiuncialia, crassiuscula, squamis lanceolatis, vel obovatis, obtusis, fuscis, pilosis. Stamina bina, capillaria, flava, basi plus minus villosa.—Antherae oblongae, aureae. Capsulae pedicellatae, subulatae, elongatae, sericeo-albae, uti pedicelli et rachis.

Species a *S. phylicifoliâ* verâ proculdubio distincta. *Fl. Brit. l. c.*

Essent. Specif. Charact.

Leaves elliptically lance-shaped, notched, smooth, glaucous underneath, seed-buds foot-stalked, lance-shaped, pointed, silky. *Fl. Brit. l. c.* TR.

Description.

This shrubby willow scarcely ever becomes arborescent. Branches straight, brittle, with a smooth blackish bark. Leaves 2 or 3 inches long, elliptically lance-shaped, acute, a little rounded at their base, both edges for the most part notched, their upper surface of a deep green colour, very smooth, and on drying become blackish; their under surface of a glaucous or sea-green colour, veiny, sometimes covered with very fine hairs. Leaf-stalks dilated at their base. Stipules, if present, rather large, obliquely heart-shaped, serrated, and smooth. Catkins from an inch to an inch and a half long, somewhat thick; scales lance-shaped, or inversely egg-shaped, obtuse, brown, hairy. Stamina two, capillary or hair-shaped, yellow, and more or less

villous and shaggy at their base. Antheræ oblong, and of a golden colour. Seed-vessels footstalked, awl-shaped, elongated, of a silky whiteness, as well as the little footstalks of the seed-vessels and the rachis.

Without doubt it is a distinct species from the true *S. phylicifolia*. Tr.

Observations.

Doctor Smith (Fl. Brit. 1. c.) states that this shrubby willow is to be found at Wrongay Fen, Norfolk, and in osier grounds in other places not uncommon, flowering in April.

And again in Eng. Bot. 1. c.—that the stem scarcely forms a tree, though it sometimes rises to 10 or 12 feet in height, with many irregular, straightish, brittle, dark coloured branches; the young ones downy. Leaves 3 inches long, lanceolate, somewhat elliptical, acute, scarcely rounded at the base, crenate in every part; dark green and smooth above, turning black when dried; beneath glaucous, veiny, sometimes a little downy. Stipulæ large, obliquely cordate, serrated, smooth, veiny. Catkins yellow, about an inch or more in length, thick and obtuse, their

males obovate, narrow, brown in their upper half, hairy. Stamina 2, distinct, thicker upwards, more or less hairy below. Capsules (in the Linnean specimen) lanceolate, brown, downy, each on a little partial stalk.

No writer except Linnæus appears to have known this willow, but he has scarcely erred in making it a variety of his *phylicifolia*, from which it differs in the much greater size of all its parts, as well as in the totally different form of its serratures, a part so peculiarly characteristic in the real *phylicifolia*.

This species Doctor Smith has named *nigricans* from the dark colour of its branches, as well as its black hue when dried, which last is not absolutely peculiar to it. *Trans. Lin. soc. l. c.*

XVI.

SALIX PHYLICIFOLIA, *tea-leaved willow*.

Willd. Sp. Pl. 4. 659. Fl. Lapp. ed. Sm. 291. t. 8. f. d. n. 351. Trans. Linn. Soc. v. 6. 123. Fl. Brit. Sm. v. 3. 1049. and 1053 *S. radicans*.—Eng. Bot. v. 28. t. 1958.

HORTUS GLASNEVINENSIS. V. VI.

Charact. Ess. Specif. w.

Foliis oblongis acuminatis undulato-serratis glabris subtus glaucis, junioribus pubescentibus, *amentis* præcocibus, capsulis pedicellatis lanceolatis acuminatis glabris.

Descriptio. w.

Rami fusco-nigricantes. *Folia* oblongo-acuminata basin versus parum angustiora undulato-serrata, supra saturate viridia, nitida, subtus glauca, utrinque glabra; juniora cano-pubescentia. *Stipulae* subrotundae, acutae, serratae. *Amenta* præcocia, mascula oblonga, quatuor lineas longa. *Amenta* foe-

minea pollicaria vel sesquipollicaria. *Squamæ* lanceolatae, villosae. *Germina* lanceolata, glabra, pedicellata. *Stylus* elongatus. *Stigma* bifidum. *Willd. l. c.*

Ess. Specif. Character.

Leaves oblong, acuminate, wavy serrated, smooth, underneath of a glaucous or sea-green colour. When young pubescent; catkins appear early. Before the expansion of the leaves; seed-vessels footstalked, lance-shaped, acuminate and smooth. *Tr.*

Description.

Branches of a blackish brown colour. Leaves oblong, acuminate, narrowed near their base, wavy serrated, upper surface of a deep green colour, shining, underneath glaucous or sea-green, smooth on both sides, young leaves with a hairy pubescence. Stipules almost rounded, acute, serrated. Catkins appearing early, male ones oblong, 4 lines long, female an inch and a half—scales lance-shaped, villous. Seed-buds lance-shaped, smooth, supported by a footstalk. Style elongated. Stigma bifid. *Tr.*

Willdenow examined it in a dry state, and informs us that it grows in woods, in Lapland, and the northern parts of Sweden, as well as in the highlands of Scotland and the south of France.

Is it the same as the following?

Descriptio. SM.

Rami læves, tenues, patentés. Folia alterna, petiolata, omnino lanceolata, acutiuscula, medium versùs præcipue inæqualitèr et latiùs crenata, inter crenas subsinuato-undulata, margine aliquantulum incrassata; basi apiceque integerima, eglandulosa; utrinque vel prorsùs glaberri-
ma, vel pilis sparsis, vix conspicuis, subpubescentia suprà saturate viridia; subtùs glauca, reticulato-vénosa. Petioli attenuati, læves. Stipulæ lunatæ, sæpius serratæ, magnitudine variæ. Amenta non vidi. Diversa a *S. phyllifolia* Jacquini. *Fl. Brit. Smith. l. c.*

Essential Specific Character.

Leaves elliptic—lanceolate, with wavy serratures, smooth; glaucous beneath. Stipulas somewhat lunate, glandular on the inside. Germen stalked, silky. Style elongated. *Eng. Bot. l. c.*

Description. SM.

Branches smooth, slender, and spreading. Leaves alternate, footstalked, altogether lance-shaped, somewhat acute, towards their middle principally, unequally and broadly notched, subsinuated and waved between the notches, their margins slightly thickened, bases and points very entire and without glands; both surfaces either altogether very smooth, or with scattered hairs, hardly visible, somewhat pubescent; upper one deep green, underneath glaucous, reticulatedly venous, or covered with a veiny network. Leaf-stalks attenuated or thinned, smooth. Stipules moon-shaped, frequently serrated, and varying in size. TR.

Observations.

Different from the *S. phylicifolia* of Jacquin. Found on the highlands of Scotland, at Finlarig, Breadalbane.

Doctor Smith Eng. Bot. l. c. having several seasons observed its growth, and at last its female catkins, has been enabled with certainty to reduce it to the *phylicifolia*.

He observes that it is a low tree or rather bush, whose long spreading decumbent branches take root as they extend on all sides. The young twigs are purplish or brown. Leaves scattered, not much spreading, on short stalks elliptic-lanceolate, acute, 2 inches long, smooth, harsh, bitter, variously crenate or serrated, the serratures peculiarly undulated; upper side dark and shining; under glaucous. Stipules small, lunate, glandular towards the base on the inside. Catkins form separate buds, stalked, cylindrical. Scales linear, silky at the back. Germen stalked, ovate-lanceolate, silky. Style smooth. Stigmas small, cloven.

Branches blackish brown. Catkins and leaves come forth rather late; in the early months, February, March and April not the least appearance of either. Female catkins rather long, slender, white and silky. Squamæ very small, blackish brown, hairy and ciliated. Germens with very long foot-stalks, silkily hairy, and cylindrical. Style small and brown, stigmas bilocular. Nectarium very small, broad, and crenate. *Wade.*

XVII.

SALIX WULFENIANA, Willdenow.—*Carinthian*
or *Wulfen's** willow.

Willd. Sp. Pl. v. 4. 660.

Charact. Ess. Specif.

Foliis ellipticis obtusiusculis serratis glabris subtus glaucescentibus; amentis *præcoccibus*; capsulis ovatis pedicellatis demum glabris.

Descriptio.

Rami fusco-nigricantes. *Folia* elliptica utrinque glabra, supra nitida, subtus glaucescentia, juniora obtusa, adulta acutiuscula basi parum angustata, serrata, serraturis in

* Baron Francis Xavier von Wolfen was one of the most skilful botanists in Germany, and perhaps the best naturalist of the age. Many of the most valuable botanical productions he, with rare modesty, published anonymously in various journals. Among his manuscripts were found a complete *Flora Norica*, descriptive of the plants of a part of Carniola, an *Agrostographia*, and several other works, which we are told contain a fund of excellent observations.

adultis undulatis, semper etiam sub vernatione glabra. *Amenta* mascula pollicaria, foeminea sesquipollicaria. *Squamæ* lanceolatae, margine pilosæ. *Germen* ovatum vel oblongo-ovatum subpubescens. *Stylus* elongatus. *Stigma* bifidum. *Capsulæ* glaberrimæ. Willd. l. c.

Ess. Specif. Charact.

Leaves elliptic, somewhat obtuse, serrated, smooth, under surface rather of a sea-green colour; catkins appearing early; capsules or seed-vessels footstalked, egg-shaped and ultimately smooth. TR.

Description.

Branches of a brownish black; leaves elliptic, smooth on both surfaces, upper one shining, underneath rather of a sea-green colour, young leaves obtuse, when full grown somewhat acute, narrowed a little at their base, serrated, the serratures undulated or waved, always in their subvernal state smooth. Male catkins an inch long, female an inch and a half. Scales lance-shaped, and hairy on their edges. Seed-bud egg-shaped or oblongly oval, somewhat pubescent. Style elongated. Stigma bifid. Seed-vesels, or capsules very smooth. TR.

Willdenow examined this willow in a dry state. A native of the Carinthian Alps.

XVIII.

SALIX SILESIACA, Willdenow.—Silesian willow.

Willd. Sp. Pl. v. 4. 660.

Charact. Ess. Specif.

Foliis ellipticis utrinque acutis concoloribus serratis, costa media, petiolis, foliisque junioribus pubescentibus, amentis præcocibus, germinibus ovato-lanceolatis pedicellatis glabris. *Willd. l. c.*

Descriptio.

Rami obscure fusci. *Folia* bipollicaria et longiora, elliptica, utrinque glabra concoloria, basi apiceque acuta, serrata, basi integerri-
ma, costa media subtus pubescens, supra quandoque glabra. *Juniora* folia pubescentia supra viridi-canescencia, subtus alba. *Stipulæ* magnæ semicordatæ serratæ. *Amenta* tantum foeminea vidi. *Squamæ* oblongæ, obtusæ, mar-

gine pilosæ. *Germina* ovato-lanceolata, glabra, longissime pedicellata. *Styli* elongati. *Stigmata* bifida.

Accedit ad *S. phylicifoliam*, differt vero foliorum forma, foliis junioribus fere tomentosis, squamis amenti foeminei margine pilosis, et defectu glaucedinis foliorum. *Salici Wulfenianæ* habitu proxima et multis notis diversa.

Pedicelli germinis hujus speciei longissime sunt pilosi, sed quandoque glabri. *Willdenow. l. c.*

Ess. Specif. Charact.

Leaves elliptic, acute on both their margins, of one colour, serrated, the middle rib, leaf-stalk, and young leaves pubescent; catkins appearing early, germens or seed-buds, ovally lance-shaped, foot-stalked and smooth.
TR.

Description.

Branches darkish brown. Leaves above two inches long, elliptic, smooth and of the same colour on both sides; base and apex acute, serrated, very entire at their base, the middle

rib pubescent underneath, upper side in time smooth. Young leaves pubescent, upper surface of a greenish canescence, underneath white. Stipules large, semicordate, and serrated. Willdenow saw the female catkins only. Scales oblong, obtuse, hairy on their margins. Germen or seed-buds, egg-lance-shaped, smooth, with very long pedicelli or foot-stalks, style elongated. Stigmas bifid. TR.

Observations.

It resembles *S. phyllicifolia*, differing however in the form of the leaves, the young ones almost downy, the scales of the female catkins hairy on their edges; and the absence of the sea-greenish colour of the leaves.

It approximates to the habit of *S. Wulfeniana*, yet in many particulars different.

The pedicelli or foot-stalks of the germens or seed-buds in this species are covered with long hairs, but after some time become smooth. TR.

Willdenow examined it in a dry state. Found on the mountains in Silesia.

XIX.

SALIX PONTEDERANA, Willdenow.—*Cenisian*,
or *sallow of Mount Cenis*.

Willd. Sp. Pl. v. 4. 661.

Charact. Ess. Specif.

Foliis ellipticis, basi obtusis, apice acutis, glabris, subtus glaucis, serratis, costa media, petiolis, foliisque junioribus pilosis, germinibus oblongis, tomentosis. *Willd. l. c.*

Descriptio.

Frutex bi-s-trepedalis, ramis obscure fuscis junioribus pubescentibus. *Folia* tripollicaria, basin versus parum angustiora, obtusa, apice acuta, rigida, supra nitida, saturate viridia, subtus glauca, glabra, margine remote serrata, serraturis glandulosis. *Costa* media subtus, et *Petioli* pubescentes autumnno vero glabri. *Juniora* folia pubescentia, alba. *Stipulae* parvæ, lanceolatae, subserratae. *Amenta*

præcocia, foeminae tantum vidi. *Squamæ* lanceolatae, pilosæ. *Germina* oblonga, tomentosa, subsessilia. *Stylus* brevis, bifidus. *Stigmata* bifida. Willd. l. c.

Ess. Specif. Charact.

Leaves elliptic, obtuse at their base, sharp at their extremities, smooth: underneath glaucous, serrated, mid-rib, leaf-stalk and young leaves hairy; seed-buds oblong and woolly, or rather downy. TR.

Description.

A shrub 2 or 3 feet high; branches darkish brown, when young pubescent. Leaves 3 inches long, a little narrower and obtuse at their extremities, upper surface shining, deep green; underneath glaucous; remotely serrated, the serratures glandulous, or furnished with glands. Mid-rib and petioli or leaf-stalks underneath pubescent, in the autumn becoming smooth. Young leaves pubescent and white. Stipules small, lanceolated, somewhat serrated. Catkins appearing early, Willdenow saw the females only. Scales lanceolate, and hairy. Seed-buds oblong,

downy, with hardly any footstalks. Style short and bifid. Stigmas bifid. TR.

Willdenow examined the female plant only, and that in a dry state. Grows on Mount Cenis, and the high mountains of Dauphiny. TR.

XX.

*SALIX LAURINA, VEL BICOLOR, shining
dark green willow.*

Willd. Sp. Pl. 4. 662. Trans. Linn. Soc. v. 6. 122. Fl. Brit. Smith. v. 3. 1048. *S. bicolor*. Eng. Bot. v. 26. t. 1806. *Salix bicolor*.

HORTUS GLASNEVINENSIS.

Charact. Essent. Specif. SM.

Folliis ellipticis acutis denticulato-serratis glabriusculis subtus glaucis, germinibus pedicellatis lanceolatis sericeis, *Fl. Brit. l. c.*

Descriptio. SM.

S. nigricanti affinis, prorsùs verò distincta. Rami teretes, fragiles, cortice fusco, glabro. Folia bi-v-triuncialia, erecta, elliptica, subacuminata, subrevoluta, undique denticulata sive subserrata; supra saturatè viridia, glabra, nitida, exsiccatione minus nigricantia, subtus valdè glauca, venosa, pilosiuscula. Petioli basi maximè dilatati, triquetri. Stipulæ parvæ, lunato-semicordatæ, dentatæ, glabræ, subtus glaucæ. Amenta vix uncialia, squamis obovatis, obtusissimis, fuscis, pilosis. Stamina bina, flava, capillaria, Antheræ subrotundæ, luteolæ. Germina pedicellata, lanceolata, minùs quam in *S. nigricanti* attenuata vel acuminata, sericeo-alba, uti pedicelli et rachis. Stylus breviusculus, glaber. Stigmata crassa, ovata, connata, indivisa vel parum emarginata. Amentis masculinis duplo minoribus, staminibus brevioribus, a *S. nigricanti* certe dignoscitur; ut et colore foliorum, margineque subrevoluto denticulato nec crenato. *Fl. Brit. Smith. l. c.*

Ess. Specif. Charact.

Leaves elliptic, acute, denticulately sawed, somewhat smooth, underneath glaucous, seed-buds foot-stalked, lanceolated, silky. TR.

Has a resemblance to the dark leaved willow (*S. nigricans*) but is to be considered as altogether distinct. Branches straight, rounded, brittle, with a smooth brown bark. Leaves 2 or 3 inches long, erect, elliptic, rather acuminate, somewhat revolute or rolled backwards, denticulated or subserrated; upper surface of a dark green, smooth, shining, on drying becoming a little blackish; underneath very glaucous, veiny, somewhat hairy. Leaf-stalks very much dilated at their base, and three sided. Stipules small, lunately half-heart-shaped or semicordate, dentated, smooth underneath of a sea-green colour. Catkins scarcely an inch long, scales inversely egg-shaped, very obtuse, brown and hairy. Stamina two, yellow, capillary. Antheræ somewhat round, yellowish. Seed-buds foot-stalked, lance-shaped, less acuminate or attenuated than *S. nigricans*, of a silky whiteness, as well as the pedicelli or little foot-stalks, and the rachis. Style somewhat short and smooth. Stigmas thick, oval, connate, or joined together, undivided, or a little emarginated, or notched. TR.

The male catkins being by the half smaller, and stamina shorter, certainly distinguishes it from *S. nigricans*; as well as the more verdant pleasant green of the leaves, the revolute or rolled backwards appearance

of their margins denticulated and not notched. TR.

Found in woods, flowering in April and May.

Observations.

Doctor Smith Eng. Bot. l. c. states that this willow was observed by the late Mr. Crowe to be not unfrequent in woods in Norfolk. Cuttings of it were taken indiscriminately from thence along with *S. caprea* to plant for the purpose of making hurdles; but the unfitness of the species before us for that use led to a discovery of their difference. Indeed nothing but the botanical inattention, which the whole genus has so long experienced, could have occasioned two such different species to be confounded.

S. bicolor grows in an upright wand-like form when young, and is known by its dark mahogany-coloured stems, and the upright stiff position of its leaves. If neglected it forms a small tree. The leaves are large, elliptical, acute, waved and obscurely serrated, or toothed, nearly smooth; dark shining green above; glaucous beneath. Stipules small, half-heart-shaped, serrated. Foot-stalks broad at the base. Female catkins an inch long

when in flower, but soon becoming twice as long. Scales underneath, very hairy. Germen lanceolate, stalked, silky; style short, with rounded, notched stigmas. Doctor Smith only saw the male in Ehrhart's dried specimen, which appears to be certainly the same species, and he adopts his name *bicolor* with the more pleasure, as it is more apt than what Doctor Smith had given already *laurina*.

Neither this willow, nor the *nigricans* before noticed are known to be of any particular use. Their branches are not endued with much flexibility or toughness.

Branches blackish brown. Leaves alternate, and ascending. Stipules small, semicordate and slightly notched. Catkins (female) oblong and white. Squamæ brownish black at their extremities and very hairy. Germen cylindrical, foot-stalked and silkily hairy, style long. Stigmas bifid, trifid, and quadrifid. Nectarium very small and upright. *Wade.*

The germens, and their foot-stalks, three times as long as the squamæ. *Wade.*

XXI.

SALIX TENUIFOLIA, *thin leaved willow.*

Willd. Sp. Pl. v. 4. 662. Fl. Lapp. ed. Smith. 292. t. 8. f. e. Herb. Linn.—Villars. Dauph. v. 3. 766. t. 50. f. 8. S. Pontederæ? Fl. Brit. Sm. v. 3. 1052. Eng. Bot. v. 31. t. 2186.

Charact. Ess. Specif. SM.

Foliis ellipticis acutis serratis glabriusculis subtùs glaucis, stipulis obsolatis, capsulis glaberrimis. *Fl. Brit. l. c.*

Descriptio. SM.

Frutex pedalis aut bipedalis, ramosissimus, patens. Rami rubicundi; juniores pubescentes, tomento brevissimo, incurvo. Folia haud sesquiuncialia, alterna, petiolata, elliptica, basi apiceque acutiuscula, medio præcipuè serrata, quandoque subundulata ut in *S. phylicifolia*,

tenuia, utrinque vel omnino glabra, vel pilis tenuissimis, albis, adpressis, sparsis, pubescentia ; suprà pulchrè ac læte viridia ; subtùs glauco-albida, venis prominulis anastomosantibus reticulata, nervo subindè piloso ; primordialia aut inferiora minora, angustiora, sæpiùs integerrima. Stipulæ exiguæ, subfalcatæ, serratæ, glaberrimæ, sæpe nullæ. Amenta masculina flavescentia, vix uncialia, squamis linearibus, angustis, canaliculatis, extus pilosissimis, diandris ; fœminea demum sesquiuncialia, capsulis sessilibus, ovato-lanceolatis, glabris. Stylus elongatus. Stigmata crassiuscula, emarginata.

Varietatem vel distinctam speciem eodem in loco legimus, foliis utrinque pilosioribus, etiam subtus villosis, minùsque plerumque glaucis, squamis masculinis obovatis, planis. Hanc ulteriori in locis spontaneis investigationi, modò Deus nobis hæc otia fecerit, relinquimus. *Fl. Brit. l. c.*

Essential Specific Character.

Leaves elliptic, acute, serrated, somewhat smooth, glaucous underneath, stipules obsolete, seed-vessels very smooth. TR.

Description.

A shrub a foot or two high, full of branches, and spreading. Branches very red; when young pubescent with very short incurved down. Leaves hardly an inch and a half long, alternate, foot-stalked, elliptic, base and apex somewhat acute, serrated principally in their middle, in time becoming somewhat undulated as in *S. phylicifolia*, thin, altogether smooth, or pubescent with very fine white, scattered close pressed hairs; upper surface beautifully and verdantly green; underneath of a glaucous white, reticulated with little prominent anastamosing veins, with a nerve now and then hairy; the primordial or inferior leaves the smallest, narrowest, and frequently very entire. Stipulæ or stipules exceedingly small, somewhat hooked, serrated, very smooth, frequently no stipules. Male catkins yellowish, scarcely an inch long; scales linear, narrow, channeled, externally very hairy, with two stamina; females only an inch and a half long; seed-vessels sessile, egg-lance-shaped, smooth. Style elongated. Stigmas somewhat thick, and notched. TR.

Observations.

Doctor Smith Fl. Brit. l. c. states that this willow is found in rocky or craggy situati-

ons, and on the banks of rivers, flowering in May and June. Above the bridge at Kirby Lonsdale, Westmoreland.

He speaks of a variety, or distinct species found in the same place, which requires further investigation.

In English Botany (l. c.) he informs us that he has with the greatest care compared it with his original specimens of *S. tenuifolia*, gathered near the place already mentioned, and found no difference, except the size and luxuriance, which rises to the height of a small tree. In consequence of this luxuriance, the stipulas are more considerable than in the wild specimens, the plant figured in Eng. Bot. being drawn from the garden specimen of Mr. T. F. Forster of Clapton, who received it from Scotland. It flowers in May.—The young branches are very slightly downy. Leaves elliptical, rather pointed, slightly serrated, besprinkled when young with fine close pressed hairs; bright green above; glaucous and whitish beneath reticulated with veins; the rib sometimes hairy. Stipulas small somewhat falcate, serrated, smooth. Male catkins yellowish about an inch long, with very hairy scales which in Mr. Forster's plant are elliptical. Stamens two. In the wild Westmoreland female shrub the cat-

kins are finally an inch and a half long, with ovate-lanceolate, smooth, sessile capsules, a long style, and rather thick notched stigmas. The original Westmoreland plant seems to vary in degree of pubescence, and in shape of the scales of the male catkin.

XXII.

SALIX AMANIANA, *Willdenow.*—*Amanian willow.*

Willd. S. Pl. v. 4. 663. Hoff. Sal. 1. p. 71. t. 17, 18, 19 and 24. f. 2. S. myrsinites.

Charact. Ess. Specific. W.

Foliis oblongo-ellipticis, acutis, serratis, glabris, subtus glaucis, petiolis longis pubescentibus, stipulis ovatis, dentatis, persistentibus, amentis præcocibus, germinibus lanceolatis, glabris. *Willd. l. c.*

Descriptio. W.

Arbor ramis fuscis, junioribus pubescentibus. *Folia* oblongo-elliptica, pollicaria, vel bipollicaria, margine serrata. Juniora folia in venis tomentosa. *Petioli* longi pubescentes. *Stipulae* parvae, ovatae, serratae, pubescentes. *Amenta* praecocia; mascula semipollicaria, oblonga. *Squamae* subrotundae fuscae pilosae. Filamenta longissima, pallide flava. *Antherae* plumbeae. *Amenta* foeminea sesquipollicaria. *Squamae* oblongae margine villosae. *Germina* ovato-lanceolata, glabra. *Stylus* mediocris, bifidus. *Stigmata* bifida.

Observatio. W.

S. myrsinites a Wulfen mecum communicata est mea *S. ammeniana*, et a *S. myrsinite* atque *prunifolia* diversissima. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong, elliptic, acute, serrated, smooth; underneath glaucous, leaf-stalks long and pubescent; stipules ovate, dentated, persistent; catkins appearing early; seed-buds lance-shaped smooth. TR.

Description.

A tree with brown branches, which when young are pubescent. Leaves oblongly elliptic, an inch or two long, upper surface a deep green and shining, underneath smooth, and glaucous, serrated on their margin. Young leaves woolly on their veins. Leaf-stalks long and pubescent. Stipules small, ovate, serrated, and pubescent. Catkins appearing early, oblong half an inch. Scales almost round, brown and hairy. Filaments very long, pale yellow. Antheræ of a leaden colour. Female catkins an inch and a half long. Scales oblong, villous on their margin. Seed-buds egg-lance-shaped, smooth. Style of a middling size and bifid. Stigmas bifid. TR.

Observation.

S. myrsinites of Wulfen communicated to Willdenow is the present willow, and entirely different from *S. myrsinites* and *S. prunifolia*. T.

Willdenow examined it in a living state. Native of the high mountains of Salzburg and Carinthia. TR.

XXIII.

SALIX HASTATA, *halbert-leaved willow*.

Willd. Sp. Pl. v. 4. 664. Fl. Lap. ed.
Smith, p. 293. art 354. t. 8. f. g.

Charac. Ess. Specif. W.

Foliis ovatis, acutis, basi subcordatis, serratis, glabris, subtus glaucis, petiolis brevissimis, glabris; stipulis semicordatis, serratis, persistentibus. *Willd. l. c.*

Description. W.

Rami fusci, glabri, juniores subpubescentes. *Folia* bipollicaria et majora, ovata, breve acuminata, basi semicordata, serrata, utrinque glabra, subtus glauca. *Petoli* dilatati, glabri, brevissimi. *Stipulae* semicordatae, serratae, petiolo duplo vel triplo longiores, persistentes. *Amentum* nondum vidi. *Willd. l. c.*

Ess. Specif. Charact.

Leaves ovate, acute, somewhat heart-shaped at their base, serrated, smooth, glaucous underneath with very short smooth petioli or leaf-stalks; stipules half-heart-shaped, serrated and pubescent. TR.

Description.

Branches brown and smooth, when young somewhat pubescent. Leaves about 2 inches long, ovate, shortly acuminate, half-heart-shaped at their base, serrated, smooth, underneath glaucous. Leaf-stalks dilated, smooth, and very short. Stipules half-heart-shaped, serrated, 2 or 3 times as long as the petioli or foot-stalks, persistent. Willdenow has not as yet seen the catkins.

He examined this willow in a dry state, without the catkins. A native of Lapland. TR.

XXIV.

SALIX SERRULATA, *Willdenow.*—*Serrulated
Lapland willow.*

Willd. Sp. Pl. v. 4. 664. Fl. Danic. 1238.
S. hastata.

Charac. Ess. Specif. W.

Foliis ovatis, acutis, serratis, glabris, subtus glaucis, petiolis brevissimis, glabris, stipulis ovatis, serratis, persistentibus; amentis coetaneis, germinibus subsessilibus, lanceolatis. *Willd. l. c.*

Descriptio. W.

Rami rufo-fusci, glaberrimi. *Folia* vix pollicaria, ovata, acuta, vel ovato-lanceolata, margine serrulata, revoluta, supra læte viridia, subtus glaucescentia, glabra, reticulato-venosa. *Petoli* brevissimi, dilatati, glabri.

L

Stipulæ ovatæ vel oblongæ, serratæ, petiolo duplo longiores, persistentes. *Amenta* mascula cylindræa utrinque attenuata, pollicaria. *Filamenta* alba. *Antheræ* purpureæ. *Squamæ* subrotundæ, fuscæ, margine pilosæ. *Amenta* fœminea, bipollicaria. *Squamæ* lanceolatæ, obtusæ, ciliatæ. *Germen* lanceolatum, glabrum, subsessile. *Stylus* brevis, bifidus. *Stigmata* bifida.

Observatio.

Valde affinis *S. hastatæ*, sed *folia* multa minora non subrotunda ovato-subcordata et toto habitu diversa. *Willd. l. c.*

Ess. Specif. Charac.

Leaves ovate, acute, serrated, smooth, underneath sea-green colour, leaf-stalks very short, smooth. Stipules ovate, serrated and persistent. Catkins appearing with the leaves. Seed-buds almost sessile, lance-shaped. *Tr.*

Description.

Branches reddish brown, very smooth. Leaves scarcely an inch long, ovate, acute, or ovally lance-shaped, their margins finely

serrated and rolled in; upper surface a bright green, underneath rather glaucous, smooth, reticulatedly veiny. Leaf-stalks very short, dilated and smooth. Stipules ovate or oblong, serrated, double the length of the leaf-stalks, persistent. Male catkins cylindrical, an inch long, and attenuated on every side. Filaments white. Antheræ purple. Scales almost round, brown, and hairy on their margins. Female catkins two inches long. Scales lance-shaped, obtuse, and ciliated. Seed-bud lanceolate, smooth, and almost sessile. Style short and bifid. Stigmas bifid.

Observation.

Bears a strong affinity to *S. hastata*, but the leaves are much smaller, not subrotund, ovally half-heart-shaped, and in short differs totally in appearance. TR.

A native of Lapland.

XXV.

SALIX DISCOLOR, *discoloured* *Pennsylvanian*
willow.

Willd. Sp. Pl. 4. 665. Muhlenb. Nov.
Act. Soc. Nat. Scrut. Berol. 4. p. 234. t. 6.
f. 1.

Charact. Ess. Specif. w.

Foliis oblongis obtusiusculis glabris, remote serratis, apice integerrimis, subtus glaucis, amentis subcoetaneis, germinibus sessilibus, lanceolatis, pilosis. *Willd. l. c.*

Description. w.

Caulis frutescens, rarius arborescens, ramis obscure fuscis. *Folia* pollicaria vel sesquipollicaria, oblonga, acutiuscula, basi parum

angustiora, remote serrata, apice integerrima, utrinque glabra, subtus glauca. *Petoli* juniores pubescentes, adulti glabri. *Stipulae* parvae, lanceolatae, serratae, deciduae. *Amenta* mascula vix pollicaria, oblonga. *Squamae* oblongae, acutae, pilosae. *Filamenta* alba. *Antherae* rubrae, demum flavae. *Amenta* foeminea pollicaria. *Squamae* oblongae, acutae, villosae. *Germina* oblongo-lanceolata, pilosa. *Stylus* mediocris. *Stigma* quadrifidum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong, somewhat obtuse, smooth, remotely serrated, very entire at their extremities, underneath glaucous; catkins rather appearing with the leaves, seed-buds sessile, lanceolate and hairy. TR.

Description.

A shrubby appearance, rarely becomes arborescent, the branches of a darkish brown colour; leaves from an inch to an inch and a half long, oblong, somewhat acute, a little narrower at the base, remotely serrated, very entire at their extremities, smooth,

underneath glaucous. Young foot-stalks, pubescent, when fully grown smooth. Stipules small, lanceolate, serrated, and deciduous. Male catkins, scarcely an inch long, and oblong. Scales oblong, acute, and hairy. Filaments white. Antheræ red, in time becoming yellow. Female catkins an inch long, scales oblong, acute and villous. Seed-buds oblongly lance-shaped, and downy. Style of a middling size. Stigma quadrifid, or cloven into four parts. TR.

Willdenow examined this willow in a dry state.—A native of watery situations in Pennsylvania.

XXVI.

SALIX PETIOLARIS, *dark long-leaved*
willow.

Willd. Sp. Pl. v. 4. 665. Trans. Lin.
Soc. v. 6. 122. Fl. Brit. Smith v. 3, 1048.
Eng. Bot. v. 16. t. 1147.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. SM.

Foliis lanceolatis serratis glabris subtus
glaucis, germinibus pedicellatis ovatis sericeis,
stigmatibus sessilibus bilobis. *Fl. Brit. l. c.*

Descriptio. SM.

Magnitudo S. bicoloris. Rami viminei,
graciles, teretes, glabri, atro-purpurei sive
fusci. Folia 4-aut 5-uncialia, unciam fere

lata, lanceolata, acuminata, undique serrata subrevoluta, basi plerumque inæqualia, suprâ lætè viridia, glaberrima, nitidiuscula; subtus glauca, interdum pilosiuscula; exsiccatione purpureo-nigricantia. Petioli elongati, graciles, lineares, supernè sericei. Stipulæ parvæ, lunatæ, dentatæ, glabræ. Amenta mascula nondum vidi; fœminea vix uncialia, squamis ovatis, obtusis, sæpe emarginatis, nigris, pilosis. Germina longius pedicellata, ovata, parva, sericea, stigmatibus omnino sessilibus ovatis, obtusis, bilobis. *Fl. Brit. Smith. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped sawed smooth glaucous underneath, seed-buds foot-stalked, ovate, silky, stigmas sessile, two-lobed. TR.

Description.

A shrub the size of the shining dark green willow. (*S. bicolor.*) Branches twiggy, slender, round, smooth, of a blackish purple or brownish colour, Leaves 4 or 5 inches long, about an inch broad, lanceolate, acuminate, serrated, somewhat revolute or rolled in, for the most part unequal at their base, upper surface of a pleasant green, very

smooth, and rather shining; underneath glaucous, sometimes rather hairy, and on drying assume a purplish black colour. Leaf-stalks elongated, slender, linear, upper part silky. Stipules small, moon-shaped, dentated, smooth. Male catkins not observed. Female catkins scarcely an inch long, scales inversely egg-shaped, obtuse, frequently notched, black and hairy. Seed-buds with long pedicelli or foot-stalks, egg-shaped, small, silky. Stigmas altogether sessile, oval, obtuse and two-lobed. TR.

Found in ozier grounds and marshy situations flowering in April.

Observations.

Doctor Smith Eng. Bot. l. c. acknowledges his obligations to Mr. Dickson for this new species of *Salix*, who found it in some parts of Great Britain; the exact place is not remembered. He only examined the female, which Doctor Smith says is a small spreading tree. The branches as before observed are slender, flexible, round, smooth, more or less purple or brown. Leaves 4 or 5 inches long, and almost an inch broad when full grown, lanceolate, pointed; serrated throughout, generally unequal at their base; bright green

and smooth above; glaucous and often a little hairy beneath; in drying they turn almost black. Foot-stalks remarkably long and slender. Stipulæ small, lunate, smooth, toothed. Female catkins scarcely an inch long, on stalks. Scales small, obtuse, often notched, black and hairy. Germen on a long stalk, ovate, silky, with 2 sessile ovate, blunt, cloven stigmas. The very young leaves are tinged with an elegant ferruginous hue, especially in the radical shoots which spring up when a tree is cut down. Such shoots in some species differ greatly from the general appearance of the plant, and require in this genus to be particularly attended to. The stigmas and germen are also of great moment in discriminating many species.

Leaves alternate, serratures distant, their extremities sphacelated. Stipules broad at their base. Female catkins small, ovate, numerous, alternate, and rather distant on the black twigs. Squamæ very small, black, and obtuse. Germen foot-stalked, ovate oblong. Stigmas trifid and quadrifid. *Wade.*

XXVII.

SALIX MYRICOIDES, *sumach-leaved Pen-
sylvanian willow.*

Willd. Sp. Pl. 4. 666. Muhlenb. Nov.
Act. Soc. Nat. Scrut. Berol. 4. p. 285. t.
6. f. 2.

Charact. Essent. Specif. w.

Foliis oblongo-lanceolatis acutis basi bi-
glandulosis, obtuse serratis, glabris, subtus
glaucis, amentis coetaneis, germinibus lan-
ceolatis, pedicellatis, glabris. *Willd. l. c.*

Descriptio. w.

Frutex sex-vel 9 pedalis, ramis viridibus
vel purpureis. *Folia* bi-rarius tripollicaria,
oblongo-lanceolata, acuta, utrinque glabra,
supra saturate viridia, subtus glauca, margine
obtuse serrata, serraturis glandulosis. *Glan-*

dula subrotunda in utroque latere marginis folii, basin versus quandoque duæ. *Stipulae* parvæ, ovatæ, acutæ, glanduloso-serratæ. *Amenta* foeminea fesquipollicaria. *Squamæ* lanceolatæ, obtusæ, margine villosæ. *Germina* lanceolata, glabra, longe pedicellata. *Stylus* mediocris, bifidus. *Stigmata* bifida. *Willdenow. l. c.*

Ess. Specif. Charact.

Leaves oblong lance-shaped, acute, with two glands at their base, obtusely serrated, smooth, underneath glaucous; catkins appearing with the leaves, seed-buds lanceolate, foot-stalked, smooth. TR.

Description.

A shrub from 6 to 9 feet high, branches green or purple. Leaves two, rarely three inches long, oblongly lance-shaped, acute, smooth on both sides, upper surface a deep green, underneath glaucous, margins obtusely serrated, serratures furnished with glands. Gland almost round on both the margins of the leaf; near their base, at times there are two glands. Stipules small, ovate, acute glandularly serrated. Female catkins an inch and a half long. Scales lance-shaped, ob-

tuse, and villous on their margins. Seed-buds lance-shaped, smooth, with long pedicelli or footstalks. Style of a middling size and bifid or cloven in two. Stigmas bifid.

Tr.

Observation.

Willdenow examined the female plants in a dry state. Found in marshy situations in Pennsylvania.

XXVIII.

SALIX CORDATA, *heart-leaved Pennsylvanian willow.*

Willd. Sp. Pl. 4. 666. Muhlenb. Nov. Act. Soc. Nat. Scrut. Berol. 4. p. 236. t. 6. f. 3.

Charact. Essent. Specif. w.

Foliis oblongo-lanceolatis, acuminatis, basi cordatis, argute serratis, glabris, petiolis glabris, amentis coetaneis, germinibus pedicellatis, lanceolatis, glabris.

Descriptio. w.

Frutex orgyalis, ramis glabris, viridibus. *Folia* tripollicaria, oblongo-lanceolata, acuminate, basi cordata, margine argute serrata, serraturis cartilagineis, utrinque glabra, supra saturate viridia, subtus pallidiora. *Petoli* glabri. *Stipulae* subrotundo-ovatae, obtusae, serratae, amplae. *Amenta* foeminea, semipollicaria. *Squamae* lanceolatae, atrae, lanatae. *Germina* lanceolata, glabra, pedicellata. *Stylus* mediocris, bifidus. *Stigma* bifida. *Willdenow. l. c.*

Ess. Specif. Charact.

Leaves oblong-lance-shaped, acuminate, heart-shaped at their base, sharply and neatly serrated, smooth; catkins appearing with the leaves, seed-buds foot-stalked, lance-shaped, smooth. TR.

Description.

A shrub a yard high; branches smooth, and green. Leaves 3 inches long, acuminate, oblongly lance-shaped, heart-shaped at

their base, sharply and neatly serrated on their margins, serratures cartilaginous, smooth on both sides, upper surfaces deep green, underneath paler. Leaf-stalks smooth. Stipules subrotundly ovate, obtuse, serrated, large. Female catkins, half an inch long. Scales lance-shaped, black, and woolly. Seed-buds lanceolated, smooth and foot-stalked. Style of a middling size, bifid or cloven in two. Stigmas bifid. TR.

Observation.

Willdenow examined the female of this willow in a dry state. Grows in marshes in Pennsylvania.

He observes that this and the next species afford the first instance of heart-shaped leaves in willows. The cordate sinus is considerable, but becomes visible only when the leaf is completely developed. Near the sinus the serratures are deeper.

XXIX.

SALIX RIGIDA, *rigid, or stiff-leaved Pen-*
sylvanian willow.

Willd. Sp. Pl. 4. 667. Muhlenb. Act.
Soc. Nov. Nat. Scrut. Berol. 4. p. 237. t. 6.
f. 4.

Charac. Ess. Specif. W.

Foliis oblongo-lanceolatis, acuminatis, basi
subcordatis, argute serratis, glabris, serratura
infima elongata, petiolis villosis, amentis *coae-*
taneis, germinibus pedicellatis, lanceolatis
glabris.

Descriptio. W.

Frutex vel arbor mediocris, ramis viridi-
bus, superne purpurascentibus, junioribus pu-
bescentibus. Folia tripollicaria, rigida, oblon-
go-lanceolata, acuminata, basi subcordata,

margine argute serrata, serratura infima elongata, apice glandulosa. *Petoli* pilosi. *Stipule* amplæ, cordatæ, obtusæ, argute serratæ, serraturis nonnullis glandulosis. *Amenta* foeminea semipollicaria. *Squamæ* lanceolatæ, atræ, lanatæ. *Germina* longe pedicellata, lanceolata, glabra. *Stylus* mediocris. *Stigma* quadrifidum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong lance-shaped, acuminate, somewhat heart-shaped at their base, sharply and neatly serrated, smooth, the lower serrature elongated, leaf-stalks villous, catkins appearing with the leaves, germens or seed-buds foot-stalked, lance-shaped, and smooth.
TR.

Description.

A shrub, or rather a tree of a middling size, branches green, purplish at their extremities, when young pubescent. Leaves 3 inches long, stiff or rigid, oblongly lance-shaped, acuminate, rather heart-shaped at their base, their margins sharply and neatly serrated, with the lower serrature elongated and a gland at its extremity. Leaf-stalks hairy. Stipules large, heart-shaped, obtuse, sharply serrated, a few of the serratures furnished with glands.

Female catkins half an inch long. Scales lance-shaped, black, and woolly. Seed-buds with long pedicelli or foot-stalks, lance-shaped and smooth. Style of a middling size. Stigma quadrifid or cloven into 4 parts. Tr.

Observation.

Willdenow examined the female plant only, and that in a dry state.

Found in the marshes in Pennsylvania.

XXX.

SALIX LUCIDA, *shining-leaved Pennsylvanian*
willow.

Willd. Sp. Pl. 4. 667. Muhlenb. Nov.
Act. Soc. Nat. Berol. 4. p. 239. t. 6. f. 7.

Charact. Ess. Specif. W.

Foliis oblongis, cuspidato-acuminatis, glabris, argute serratis, serraturis glandulosis, amentis coetaneis, germinibus lanceolato-subulatis, pedicellatis, glabris.

Descriptio. W.

Rami fusco-lutei glabri, *Folia* tripollicaria, oblonga, apice in acumen longissimum cuspidatum producta, basi parum attenuata, margine argute serrata, serraturis glandulosis, utrinque glabra, supra nitida, subtus pallid-

iora. Stipulæ subrotundæ, serratæ, petiolatæ. Amenta foeminea semipollicaria. Squamæ lanceolatæ, basi pilosæ, apice dentatæ, glabræ. Germina lanceolato-subulata, pedicellata. Stylus brevis. Stigma quadrifidum, obtusum. Willd. l. c.

Ess. Specif. Character.

Leaves oblong, cuspidately acuminate, smooth, neatly and sharply serrated, serratures furnished with glands, catkins appearing with the leaves. Seed-buds lance-awl-shaped, foot-stalked, smooth. Tr.

Description,

Branches brownish yellow, smooth; leaves 3 inches long, oblong, their extremities drawn out into a very long sharp point, a little attenuated at their base, neatly and sharply serrated on their edges, serratures furnished with glands, smooth on both sides, upper surface shining, underneath of a paler colour. Stipules somewhat round, serrated, petiolated. Female catkins half an inch long. Scales lance-shaped, hairy at their base, dentated and smooth at their extremities. Seed-

buds lance-awl-shaped, foot-stalked. Style short. Stigma quadrifid or parted into four, and obtuse. TR.

Observation.

Willdenow inspected the female plant only in a dry state.

Found in marshes in Pennsylvania.

Mr. Muhlenberg observes, that this species, the *S. discolor* and *rigida*, are preferred by the natives for making baskets.

XXXI.

SALIX ACUTIFOLIA, Willdenow.—*Caspian*
sharp-pointed-leaved osier or willow.

Willd. Sp. Pl. 4. 668. *Salix violacea*, violet coloured willow, Andrews Repository v. 9. t. 581.—Plate, Frontispiece.

HORTUS GLASNEVINENSIS.

Charact. Essent. Specif. W.

Foliis lanceolatis, acuminatis, inequaliter obtuse serratis, glabris, subtus glaucescentibus, ramis pruinosis.

Description. W.

Arbuscula ramis atro-violaceis, pruina tenuissima obductis, cernuis tenuibus. *Folia*

tri-vel 4 pollicaria, lanceolata, acuminata obtuse remote serrata, glabra, subtus glaucescentia. Petioli quadrilineari glabri. *Stipulae* lanceolatae, acuminatae, serratae, petiolo breviores. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, acuminate, unequally and obtusely serrated, smooth, underneath of a sea-greenish colour; branches hoary. TR.

Description.

A small tree, with deep violet-coloured branches, slender, and drooping, covered all over with a most delicate thin hoariness. Leaves 3 or 4 inches long, lance-shaped, acuminate, obtusely and remotely serrated, smooth, underneath rather of a sea-green colour. Leaf-stalks quadrilinear, smooth. Stipules lance-shaped, acuminate, serrated, shorter than the petioli or leaf-stalks. TR.

Observations.

Willdenow examined this beautiful willow in a living state, but without the catkins;

and he states with a mark of doubt? that it is found about the Caspian sea.

Andrews l. c. gives the following specific character of this willow.

S. foliis lanceolatis, acuminatis, serratis, seu serrulatis, glabris, subtus glaucis, ramis pulvere violaceo tectis !

Leaves lance-shaped, acuminate, serrated or finely sawed, (serrulated) smooth, underneath glaucous, and the branches covered with a violet-coloured powder. Tr.

This specific description of Mr. Andrews is by no means characteristic or satisfactory of the willow under consideration; neither is the amentum or catkin which accompanies his figure.—He remarks that this fine species of willow is remarkable for the gigantick size of its shoots, rising, to the height of 10 sometimes 12 feet in one season; secondly for the superior tenacity, being yet more tough than the common ozier; thirdly for the singular blue powder, resembling that found upon the Orleans plum, with which they are always covered, and which, when any part of it has been accidentally rubbed off, is very quickly regenerated. It is said according to Mr. Andrews to be a native of

Russia or Siberia, and to have been introduced by Mr. John Bell of Norgate about the year 1798.

Whether it may not be the species *Salix acutifolia* of Willdenow, which he published without having seen the fructification, we leave to those, who have seen his specimen, to determine. *Andrews. l. c.*

Mr. Andrews's specimens are from the collections of A. B. Lambert Esq. who informed Mr. Andrews, that it produces in April male flowers annually at Boyton, and, besides its great utility, it is a very ornamental plant.

Even from the above short account of this willow, it appears to be a most valuable species for introducing into our osieries, as well as into our ornamental grounds, and therefore must justify the giving a more detailed and satisfactory view of it.

This species of willow was introduced into the Dublin Society's Botanical garden, at Glasnevin, about 7 or 8 years ago, under the name of the *Russian willow*, and although its progressive growth of trunk or stem in height or girth, in the situation just mentioned, has not been proportionate in the most

distant degree to the great extent, quick growth, and woody solidity of its shoots or branches, yet still these latter circumstances, joined to the great and uncommon flexibility of its leading shoots, and delicate tough young twigs, together with their beautiful colour, must render it an interesting and valuable osier, and well worthy of attention and cultivation.

It appears to be remarkably hardy, and produces its amenta, catkins, or little assemblage of flowers, and leaves earlier than any other species—so early as February the catkins frequently appear, and by the latter end of March not one is to be seen, and the leaves develope from their buds early in April—the flowers of this salix, as affording so very early food for bees, may be well worthy of being planted about apiaries, with other early flowering species, as the *S. caprea*, *aquatica*, *viminalis*, &c.—indeed other early flowering trees and shrubs might be planted around such situations with advantage, as the hazel, birch, dwarf almond, *pyrus præcox*, or early flowering pear, rosemary, *cornus mascula* or male dogwood, *lonicera Tatarica* or Tartarian honey-suckle, *laurestines*, *erica herbacea*, or early flowering heath, mezereon, &c. besides many herbaceous plants.

To conclude for the present any further remarks on this apparently valuable osier, it now becomes necessary to throw it into scientific detail.

The trunk or stem is about 4 or 5 inches in circumference, 3 or 4 feet high, and uneven or crooked. Branches or shoots, tough, exceedingly flexible, wand-like, furrowed or grooved, and sometimes variegated—the main shoots ascending, stout and many feet high—the lateral branches above 12 feet long measured to their delicate twiggy extremities—of a purpleish black colour, frequently beautifully rubicund, covered over with an exceedingly fine subtile, evanescent, and immediately regenerating bluish white powder, easily rubbed off with the fingers. Leaves petiolated or with footstalks, lance-shaped, acuminate or ending in an elongated point, for the most part distantly serrated or sawed, the serratures tipped with a yellowish brown gland. Stipules lance-shaped, dentated or distantly sawed, by twos at the very base of the petioli or leaf-stalks. Male amenta or catkins large, sessile, oblongly oval, by twos, alternate and approximating, sometimes single, very deciduous or soon falling off, and thus circumstanced distant on the branches, and generally at their extremities. Squamæ or

calyx scales acute, very hairy, and blackish brown. Stamens two, filaments very slender, capillary, twisted, and pale yellow. Nectaria small, solitary, straight, obtuse, and placed opposite to the squamæ.

XXXII.

SALIX JAPONICA.—*Japan willow.*

Willd. Sp. Pl. 4. 668. Flor. Japonic. 24.

Description.

Arbor mediocris. *Rami* teretes, flexuosi, erecti, cinerei, glabri, ramulosi, ramulis alternis. *Folia* alterna, petiolatâ, lanceolata, acuminata, serrata, supra viridia, subtus glauca, utrinque glabra; juniora villosa, patula, digitalia. *Petioli* lineam longi. Flores e gemmis cum foliis. *Thunberg, l. c.*

Description.

A middling sized tree. Branches round, bending, erect, ash-coloured, smooth, twiggy, and alternate. Leaves alternate, foot-stalked, lance-shaped, acuminate, serrated; upper surface green, underneath glaucous, smooth on both sides; when young villous, spreading, and a finger's length. Petioli or leaf-stalks a line long. Catkins appearing with the leaves from the buds. TR.

Observation.

A native of Japan, growing near Nagasaki, and in other places, flowering in March. *Thunberg, l. c.*

XXXIII.

SALIX VITELLINA, yellow willow, or golden
osier, gold string willow.

Willd. Sp. Pl. 4. 668. Hoff. Sal. v. 1.
27. t. 11, 12. t. 24. f. 1. Flor. Brit. Smith
v. 3. 1050. Eng. Bot. v. 20. t. 1389.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. w.

Foliis lanceolatis acuminatis glabris, subtus
glauciscentibus serratis, petiolis pilosiusculis,
amentis coactaneis, germinibus sessilibus lan-
ceolatis, glabris, stigmatibus sessilibus bi-
lobis.

Descriptio. W.

E longinquo jam ramis flavis dignoscitur. Ramorum colore, foliis, et *florum foemineorum* forma, a *S. alba* diversissima, nec in hanc, ut Haller perhibet, mutatur, si etiam imputata maneret. Willd. l. c.

Ess. Specif. Charact.

Leaves lanceolate, acuminate, smooth; under surface rather of a sea-green colour, serrated; petioli or leaf-stalks somewhat hairy; catkins appearing with the leaves; seed-buds sessile, lance-shaped, smooth; stigmas sessile and two-lobed. TR.

Description.

It is known at a distance by the yellow colour of its branches. The colour of the branches, and the form of the female catkins and leaves, are very different from the white or timber willow (*S. alba*,) neither is it changed into the *S. alba* as Haller imagined. TR.

Observation.

Willdenow, who examined this willow in a living state, tells us that it is to be met with in Germany, France, Switzerland, Carinthia and England.

Charact. Essent Specif. SM.

Foliis lanceolatis acutis exstipulatis serratis, supra glabris: serraturis cartilagineis, stigmatibus emarginatis. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor mediocris. Rami erectiusculi, lutei, nitidi. Folia subsessilia, lanceolata, acuminata, serraturis crebris parvis, cartilagineis; supra glabra, nitida; subtus cæsia, subsericea; juniora utrinque sericea; primordialia obtusa, et integerrima. Stipulæ nullæ. Amenta cylindracea, acuta, squamis ovato-lanceolatis, extus pubescentibus. Stamina duo, distincta. Germen sessile, lanceolatum. Stigmata emarginata.

Hanc speciem ex auctoribus conscripsi, nec fructificationem ejus adhuc satis examinaui. Hujus affinitatem cum *S. alba* jamdudum notavit Hallerus, quam posteriores plerumque nec confirmant neque impugnant.

Liber in hac specie luteus, Hoffman. Fl. Brit. l. c.

Essential Specific Character. SM.

Leaves lance-shaped acute without stipules; upper surface smooth, serrated; the serratures cartilaginous; stigmas notched. TR.

Stipulae small and deciduous, smooth on their inside. *Eng. Bot.*

Description. SM.

A tree of a middling size. Branches somewhat erect, yellow and shining. Leaves subsessile, lanceolated, acuminate, serrated, the serratures close together, small and cartilaginous; upper surface smooth and shining; underneath sky-coloured, and somewhat silky; the young leaves silky on both sides, the very young ones obtuse and very entire. No stipules. Catkins cylindrical, acute, scales

ovate-lance-shaped, externally pubescent. Stamens two, distant. Seed-buds sessile, lance-shaped. Stigmas emarginated or notched.

Authors, who have written on this species of willow, have neither sufficiently examined it, or its catkins. Haller long since took notice of the affinity which it bore to *S. alba*, which, for the most part, has not been confirmed or denied by authors of more recent date. TR.

Observations.

The bark of this species of willow is yellow. *Hoffman*. TR.

Doctor Smith Fl. Brit. l. c. states that it is to be found in osier grounds and marshy situations. At Ovington, near Watton, Norfolk, abundantly, and truly wild, flowering in May.

And again in Eng. Bot. l. c. He observes that it is not unfrequent in osier grounds; but that he had scarcely seen native specimens till Mr. Crowe observed it abundantly in rough low pastures at Ovington near Watton, Norfolk, unquestionably wild. Of late it has become fashionable for planting in

low situations, being a handsome tree of a moderate height, conspicuous for its gracefully pendent golden twigs; the tips of which however are often killed by severe cold, and look shabby in the spring like the exotic weeping willow. The leaves are lanceolate, narrow, long pointed, silky when young, their serratures glandular, small and uniform. Stipulæ small, serrated, deciduous, mostly altogether wanting; their upper side smooth. The catkins come out in April or May, and are yellow, acute, with wrinkled hairy scales. Stamina 2, very rarely 3. Nectary of 2 or 3 notched scales. Germen lanceolate, sessile. Stigmas notched. This description of Doctor Smith's may serve to correct the Fl. Brit. already noticed, and Hoffman, especially concerning the stipulæ.

Haller very erroneously supposed this not distinct from *S. alba*.

Hoffman l. c. that the bark of this willow when fully grown is ash-coloured, full of cracks or chinks internally of a cinnamon colour; the young branches are always yellow or the colour of the yolk of an egg, of a bitter taste and astringent. The wood is white, very tough and flexible, and is therefore used by the common people for a variety of purposes, especially basket work, binding

rods &c. It oftentimes becomes a very high tree, growing in gravelly situations. The female tree when left to itself, the branches become pendulous, and is easily distinguished from all others by this circumstance; the pruned tree frequently sends forth very rigid branches. The delicate down of the seeds has been made into a common sort of paper, and may answer as a substitute for the genuine cotton. The bark properly managed has been used for dyeing various colours. The medical properties of the bark of this willow, as of many other species, are worthy of notice; certain it is that it has been found serviceable in agues. The extract of the bark is very bitter.

It is common all over Russia, and is used for palms at Easter in the Greek churches. *Pallas. Fl. Ross.* 1. 76.

Leaves alternate. Male catkins many, alternate, slender and bowed, with long foot-stalks—the female catkins are small, alternate and on short foot-stalks. *Wade.*

XXXIV.

SALIX FRAGILIS, *crack willow*.—*Huntington-*
shire willow?

Willd. Sp. Plant. 4. 669. Fl. Brit. Sm.
3. 1051. Eng. Bot. v. 26. t. 1807. Woodvil.
Med. Bot. ed. alt. p. 18. t. 8.

HORTUS GLASNEVINENSIS. IV. V.

Charac. Ess. Specif. W.

Foliis lanceolatis acuminatis concoloribus
glabris glanduloso-serratis, amentis coetaneis,
nectario masculorum gemino, germinibus sessi-
libus lanceolatis glabris.

Descriptio. W.

Arbor procera. *Amenta* ad basin pedun-
culi gerunt foliola 2 aut 3, sæpius caduca.

Rami digito concussi ad genicula annotina dissiliunt. *S. Androgyna Rothii*, ut ex pluribus speciminibus vidi, est monstrosa hujus varietas. *Willd. l. c.*

Ess. Specif. Charact. w.

Leaves lance-shaped, acuminate, of the same colour, smooth, glandulously serrated, catkins appearing with the leaves, the masculine nectarium geminous or double, seed-buds sessile, lance-shaped, and smooth. *TR.*

Description. w.

A lofty tree. Catkins coming forth at the base of the pedunculus or foot-stalk, with 2 or 3 folioli or very small leaves, frequently caducous, or falling off very soon. Branches on the least touch, break off suddenly at the last year's joints. The *S. Androgyna* of Roth from the appearance of many specimens, is nothing else but a monstrous variety of this willow. *TR.*

Willdenow examined this willow in a living state, and he asserts that it is a native of Sweden, England, and the north of Germany.

Charact. Essent. Specif. SM.

Foliis lanceolatis acuminatis undique serratis glaberrimis, petiolis dentato-glandulosis, nectario masculinorum gemino. *Fl. Brit. l. c.*

Descriptio. SM.

Rami erecti, læves, luteolo-fusci, basi fragillimi. Folia petiolata, 3—5 uncialia, lanceolata, acuminata, a basi ad apicem serrata, serraturis obtusis, inflexis, glandulosis; utrinque glaberrima, supra nitida; juniora apice ciliata; primordialia ovata, reflexa. Stipulae rotundatae, obsoletè dentatae, majusculae, at sæpius nullae. Amenta masculina pallida, cylindracea, laxiuscula, squamis obovatis, villosis. Nectarium e glandulis (optimè monente Hoffmanno) duabus, luteis, quarum major inter stamina et rachin, minor è contrario inter stamina et squamam collocatur. Stamina duo, filiformia, glabra. Amenta foeminea nondum vidi. *Fl. Brit. Smith. l. c.*

Sub hoc nomine plures species apud nos forsitan lateant (confer Hoff. loc. cit.) at nondum rem probandi aut improbandi occasio data fuit.

Ess. Specif. Charact. SM.

Leaves lance-shaped, pointed, serrated on both edges, very smooth, leaf-stalks dentatedly glandulous, the male nectarium double. TR.

Leaves ovate-lanceolate, pointed, serrated throughout, smooth. Foot-stalks glandular. Germen ovate. Male flowers with an abortive germen. *Eng. Bot.*

Description. SM.

Branches erect, smooth, of a yellowish brown colour, very brittle at their base. Leaves foot-stalked, from 3 to 5 inches long, lance-shaped, ending in a point, serrated throughout, the serratures obtuse, inflected or bent, and furnished with glands, very smooth on both sides, upper surface shining; the young leaves ciliated at their extremities; the very young ones ovate, and reflexed or bent back. Stipules rounded, obsoletely toothed, large, and frequently none. Male catkin pale, cylindrical, somewhat lax, not tense, scales inversely egg-shaped, villous. Nectarium composed of two glands, (as beautifully observed by Hoffman) yellow, the largest of which is placed

between the stamina and rachis, and on the contrary the smallest between the stamina and squama or scale. Stamina two, filiform or slender, smooth. Female catkin not observed. TR.

Observations.

Many British species of willow, perhaps, bear the specific or trivial name exclusively given to this species, a circumstance not as yet sufficiently ascertained.

According to Flora Britannica it is a tree willow growing in osier grounds and banks of rivers, flowering in April and May.

In English Botany l. c.—Not unfrequent in low marshy grounds, about the banks of rivers, flowering in May. Several trees of this species are to be seen at Mill-bank, Westminster, and other parts of that neighbourhood. The name alludes to its extreme brittleness, in the spring, at the base of the young branches, which with the slightest blow start from the trunk. This circumstance however is observable in several other smooth willows.

S. Fragilis forms a large bushy tree, remarkable for the crooked position of its branches and its large, broad, dark and shining leaves, which incline to an ovate figure when fully grown, being more or less rounded towards the base. Their serratures are numerous, uniform and regular, a little incurved, glandular, but scarcely viscid. Foot-stalks glandular at the top. Stipulas half-heart-shaped, toothed. Catkins in separate buds from the leaves, on shortish leafy stalks. The male ones smooth, with a rounded nectary, and an incurved abortive germen. Female scales longer. Germen inclining to ovate, smooth, the length of the scale, nearly sessile. Stigmas cloven to the base, narrow. Style short.

Doctor Smith being now (1808) well acquainted with *S. decipiens* of Hoffman, hereafter to be noticed, finds it very different from this.

Villars remarks that, though the branches are brittle on the tree, yet they are pliant when it is young or kept down for osiers; and that the male flowers have three stamina.

It is of quick growth and soon forms a shade in wet places; the male trees are fittest

for this purpose. The catkins of this species, as well as of many other species, afford an early food for bees, and which they seem to delight in. *Fl. Suec.* p. 347.

Woodville l. c. observes, that the bark of this willow manifests a considerable degree of bitterness to the taste, and is also astringent; hence it has been thought a good substitute for the Peruvian bark, and upon trial was found to stop the paroxysms of intermittents; it is likewise recommended in other cases requiring tonic or astringent remedies. Not only the bark of this species of *salix*, but that of several others, possesses similar qualities, as observed before when treating of *S. triandra* and *S. pentandra*, as likewise the *S. alba* hereafter to be noticed, all of which are recommended in foreign pharmacopoeias. But it is the opinion of the late Doctor Woodville, that the bark of the *S. triandra*? is more effectual than that of any other of this genus; at least its sensible qualities give it a decided preference.

The branches are black—leaves irregularly serrated with whitish glands on their serratures, longly acuminate, much larger than *S. Russelliana*, and their petioli or leaf-

stalks long. Stipules by two, large, semicordate, with many small white glands on their gins. Male catkins club-shaped. Squamæ or calyx scales concave, hairy, and yellowish green. Stamens two and filiform. Nectarium very small, and placed between the squamæ and stamens. *Wade.*

XXXV.

SALIX PRÆCOX, early flowering
willow.

Willd. Sp. Pl. 4. 670.

HORTUS GLASNEVINENSIS.

Charact. Ess. Specif. W.

Foliis lato-lanceolatis, acuminatis, glanduloso-serratis, glabris, subtus glaucis, amentis præcocibus, germinibus sessilibus, ovatis, glabris, stylis elongatis.

Descriptio. W.

Arbor ramis fuscis, fragilissimis. *Folia* sesqui-vel pollicaria, lato-lanceolata, acumi-

nata, glanduloso-serrata, supra nitida, subtus glauca, glabra. Juniora folia albida, pubescentia. *Petoli* et ramuli juniores pilis raris obsiti. *Stipulae* parvae, lanceolatae, serratae. *Gemmae* crassae, quandoque quasi geminae. *Amenta* praecocia, cylindracea, villosa, iis *S. capreae* simillima, mascula pollicaria, foeminea sesquipollicaria. *Squamae* lanceolatae, villosae. *Germen* ovatum, glabrum. *Stylus* filiformis. *Stigmata* quatuor, cylindracea, crassa. *Amentum* fructiferum quadripollicare, capsulis breve pedicellatis nudis obsitum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves broadly lance-shaped, acuminate or ending in a point, glandulously serrated, smooth, underneath sea-green colour, catkins appearing very early, seed-buds sessile, oval, smooth, with elongated styles. TR.

Description.

A tree, with brown, very brittle branches. Leaves from an inch to an inch and a half long, broadly lance-shaped, acuminate, glandular serratures, upper surface shining, underneath glaucous and smooth. Young leaves whitish, and pubescent. Leaf-stalks and

branches covered all over with very delicate hairs. Stipules small, lance-shaped, serrated. Buds thick, in time appearing as if double. Catkins appearing very early, cylindrical, villous, like those of *S. caprea*, male an inch long, female an inch and a half. Scales lance-shaped, and villous. Seed-bud ovate, and smooth. Style thread-shaped. Stigmas four, cylindrical, and thick. The seed bearing catkin four inches long, with short, foot-stalked, smooth seed-vessels. **Tr.**

Observation.

Willdenow examined this willow in a living state. Found on the banks of rivers in Austria, Carinthia, Carniola, Italy, Tyrol, Salzburg, Switzerland, and the south of France.

XXXVI.

SALIX LONGIFOLIA, *Susquehana long-leaved*
willow.

Willd. Sp. Pl. 4. 670. Muhlenb. Nov.
Act. Soc. Nat. Scrut. Berol. 4. p. 238. t. 6.
f. 6.

Charact. Ess. Specif. w.

Foliis linearibus basi apiceque acuminatis,
remotissime serratis, concoloribus, glabris,
amentis coetaneis, staminibus basi barbatis.

Descriptio. w.

Frutex bipedalis cortice fusco, ramis al-
bidis. *Folia* tri-vel 4 pollicaria, linearia, basi
et apice acuminata, remotissime serrata, utrin-
que viridia, glabra. *Stipulae* minutissime lan-
ceolatae, serrulatae. *Amentum* masculinum.

villosum, squamis retusis planis. *Filamenta* bina, squama duplo longiora, basi barbata. *Antheræ* luteæ. *Amentum* foemineum ignotum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves linear, base and extremities acuminate or pointed, very remotely serrated, of one colour, smooth; catkins appearing with the leaves, stamina bearded at their base. *Tr.*

Description.

A shrub two feet high, with a brown bark, and whitish branches. Leaves 3 or 4 inches long, linear, acuminate at their base and apex, very remotely serrated, green on both sides, smooth. Stipules very minute, lance-shaped, serrulated or very finely sawed. Male catkin villous, with the squamæ or scales smooth, and retuse or ending in a broad shallow notch. Filaments by twos, double the length of the squamæ or scales, and bearded at their base. *Antheræ* or anthers yellow. The female catkins unknown. *Tr.*

Observation.

Willdenow examined it in a dry state, and without the catkin. A native of the Susquehana river in North America.

This species bears some resemblance to our common *S. viminalis*, or osier, with regard to its long leaves, but they are completely smooth, of half the width only, and their teeth remote.

XXXVI.

SALIX BABYLONICA, *Babylonian, or weeping willow.*

Willd. Sp. Pl. 4. 671. Gmel. it. 3. 309.
t. 34. f. 2. Laurer. Cochinchin. ed. Willd. 747.
Pallas. Fl. Rossic. 1. 78.

HORTUS GLASNEVINENSIS.

Charac. Ess. Specif.

Foliis lanceolatis, acuminatis, serrulatis,
subtus glaucis, amentis coetaneis, germinibus
ovatis sessilibus glabris.

Descriptio. w.

Rami laxi, læves, juncei, purpurascens.
Folia angusto-lanceolata, argute serrata, gla-
bra, glauca, costa albida. *Stipulae* rarius,

subrotundæ, minimæ; sæpius earum loco utrinque punctum glandulosum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lanceolate, acuminate, very finely serrated, underneath glaucous, catkins appearing with the leaves, seed-buds oval, sessile and smooth. **TR.**

Description.

Branches long, smooth, rushy and purplish. Leaves narrowly lance-shaped, sharply serrated, smooth, glaucous, with a whitish rib. Stipules rather rare, almost round, very small, and very frequently in their place a glandulous point only is to be met with. **TR.**

Observations.

Willdenow, who examined this willow in a recent state, informs us that it grows in the East and in Barbary.

The weeping willow grows to a considerable size; one has been observed four feet

and a half in circumference at three feet above the ground, and at least 30 feet in height, at the age of thirty four years. The weeping willow is remarkable and generally esteemed for its long pendulous slender branches, which give it a peculiar character, and render it a beautiful object on the margin of streams or pools.

In addition to other habitats Pallas mentions it as growing every where in the Chersonesus Taurica, but probably not indigenous there, and states that it grows spontaneously on the coast of Persia. Laureiro informs us that it is common in China, but cultivated, and not so frequent in Cochin-china.

Professor Martyn, in his valuable edition of Miller's Gardener's Dictionary, recites the following paragraph, which he observed in the St. James's Chronicle (n. 6817. aug. 25. to 27. 1801) but from what source he could not trace. The famous and admired weeping willow, planted by Pope, which has lately been felled to the ground, came from Spain, inclosing a present to the late Lady Suffolk. Mr. Pope was in company when the covering was taken off; he observed that the pieces of stick appeared as if they had some ve-

getation, and added, perhaps they may produce something we have not in England. Under this idea he planted it in his garden, and it produced the willow tree, that has given birth to so many others.

XXXVII.

SALIX SUBSERRATA, *Egyptian willow*.

Willd. Sp. Plant. 4. 671.

Charact. Ess. Specif. w.

Foliis lanceolatis, utrinque acuminatis, basi glandulosis; apice obsolete serrulatis glaberrimis.

Descriptio. w.

Rami teretes, virides, glabri. *Folia* quadrilobularia, lanceolata, apice basique acuminata, utrinque viridia, glabra, margine integerrima vel subrepanda, apice obsolete serrulata, basi supra glandulis pluribus instructa, quæ

numero et dispositione variant, et sæpius in petiolum dispersa. *Petoli* quadrilineares glabri. *Stipulæ* subrotundæ, semicordatæ, obtusissimæ, margine glandulosæ. *Flores* non vidi. *Folia* S. Babylon. simillima. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, acuminate on both sides, with glands at their base, their extremities obsoletely serrulated, or their serratures scarcely discernible, very smooth.
Tr.

Description.

Branches taper, green and smooth; leaves 4 inches long, lance-shaped, extremities and base sharp pointed, green and smooth on both sides, margins very entire, or somewhat wavy or bordered with numerous minute angles and small segments of circles alternately, at the apex obsoletely serrulated, above their base many glands, which vary in number and disposition, and are frequently scattered or spread on the petiolus or leaf-stalk. Leaf-stalks 4 lines long, smooth. Stipules somewhat round, half-heart shaped, very obtuse

and glandular on their margins. Catkins have not been observed. The leaves are very like those of *S. Babylonica*, or weeping willow. TR.

Willdenow examined this willow without catkins in a dry state.

A native of Egypt.

XXXVIII.

SALIX PURPUREA, bitter purple willow—
black sallow?—black withy?—safety?

Willd. Sp. Pl. 4. 672. Trans. Lin. Soc. v. 6. 113. Arduin. Mem. 1. 67. t. 11. et Ehrhart. Arb. 58. *S. monandra*.—Fl. Brit. Sm. 3. 1039. Eng. Bot. v. 20. t. 1388.

HORTUS GLASNEVINENSIS. III.

Charact. Ess. Specif. SM.

Monandra decumbens, foliis ovato-lanceolatis serratis, glabris, stigmatibus brevissimis ovatis subsessilibus. *Fl. Brit. l. c.*

Descriptio.

Frutex tri-aut quadri-pedalis, decumbens. Rami viminei, adscendentes, tenacissimi, teretes, glaberrimi, lucidi, sæpe purpurascens. Folia opposita, vel alterna, brevius petiolata, obovato-lanceolata, vel sublinearia, apicem versùs præcipuè serrata, brevius acuminata, glabra, subtùs glauca, valdè amara. Stipulæ nullæ. Amenta mascula alterna vel opposita, solitaria, subsessilia basi bracteata, cylindræa, vix uncialia, gracillima, obtusa, multiflora, supernè primo florentia. Squamæ apice nigricantes, pilosæ. Glandulæ nectariferæ solitariae, squamis oppositæ. Stamen unicum. Anthera gemina, seu quadriloba, fulva. Amenta foeminea in distincta planta, masculis similia. Germen sessile parvum, ovato-ellipticum, sericeum. Stylus brevissimus, ut ferè nullus. Stigmata parva, sessilia, subovata, indivisa, sulco supernè exarata. Capsula ovata, parva, sericea. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

One stamened and *decumbent*, leaves oval lance-shaped, sawed, smooth, very short ovate subsessile stigmas. TR.

Description.

A shrub 3 or 4 feet high, and decumbent. Branches twiggy, ascending, remarkably tough, round, very smooth, shining and frequently purplish. Leaves opposite or alternate, with short foot-stalks, inversely egg-lance-shaped, or sublinear, serrated principally towards their apex, ending in short points, smooth, under side glaucous, with an extremely bitter taste. Stipules none. Male catkins opposite or alternate, solitary, somewhat sessile, furnished with bracteæ or floral leaves at their base, cylindrical, scarcely an inch long, very slender, obtuse, many flowered; the flowering first beginning at their extremities. Squamæ or scales black at their tips, and hairy. The nectariferous glands solitary and opposite the squamæ or scales. One stamen. Antheræ double, or four-lobed, and of a deep yellow colour. Female catkins on a distinct plant, like the males. Seed-bud sessile, small, ovally elliptic, and silky. Style very short, almost none. Stigmas small, sessile, somewhat oval, undivided, and furrowed with a groove at the top. Capsules or seed-vessels oval, small, and silky.

Tr.

Observations.

Willdenow mentions this willow as growing in Sweden and Germany.

Doctor Smith Fl. Brit. l. c. observes, that it is of rare occurrence in marshes and near rivers in England. In King-street meadows, Norwich, flowering in March.

In English Botany it is stated that, though this willow was formerly gathered in the last situation, it is scarcely to be found there, nor does it often occur in other places. At least few British botanists appear to have seen it, else they could hardly have so readily followed Hoffman in considering it one species with *S. Helix* next to be considered. It agrees indeed with that in having a simple stamen and 4-lobed anthera, but differs in its spreading decumbent habit, never growing up into a tree; the rich purple of its branches, and the somewhat deeper hue of its leaves. More especially it is distinguished, by having much more small and slender catkins, a more elliptical germen, and small ovate, obtuse, nearly sessile stigmas. The leaves are very often opposite. The floral scales are small, obtuse and black. The bark has a very bitter taste, as in *S. Helix*, to which this

species bears much the same kind of affinity as *S. Lambertiana* does to *S. Forbiana*, both of which will be immediately taken notice of.

Branches blackish purple *all round*, and thicker than *S. Helix*. Leaves obtusely serrated, for the most part blunt, and narrower than in *Helix*; indeed there appears to be a more general tendency to bluntness in *purpurea* than in *helix*,—petioli or leaf-stalks broader and stouter. Stipules hardly any. Male catkins in general opposite, small, erect, blunt, brownish gold colour, shorter than in *Helix*. Squamæ or calyx scales small, obtuse, hairy and black. One small stamen, antheræ quadrilocular, golden pollen very abundant. Nectarium exceedingly small. Female catkins opposite, slender, small. Squamæ black, small and rounded. Germen or seed-bud very small, cylindrical and acute. Nectarium exceedingly minute. *Wade.*

XXXIX.

SALIX HELIX, *rose willow—purple willow tree*
—black withy? tafety?—smooth narrow-
leaved willow—black willow?

Willd. Sp. Pl. 4. 672. Trans. Lin. Soc. v. 6. 114.—Fl. Lond. Curt. v. 2. t. 364, and Hoffm. Hist. Sal. p. 18. t. 1. f. 1, 2. t. 5. f. 1. t. 23. f. 1. *S. monandra*.—Fl. Brit. Sm. v. 3. 1040. Eng. Bot. 19. t. 1343.

HORTUS GLASNEVINENSIS.

Charact. Ess. Specif. SM.

Monandra erecta, foliis lanceolatis acuminatis serrulatis glabris, stylo elongato filiformi, stigmatibus linearibus. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor gracilis, erecta, humilis, vix decem-pedalis. Rami viminei, teretes, tenaces, glaberrimi, cinerei aut purpurascens, nitidi. Folia opposita vel alterna, petiolata, lineari-lanceolata, acuminata, utrinque attenuata, apicem versùs serrulata, glabra, subtùs glaucescentia, gus-

tui minùs amara. Stipulæ nullæ. Amenta mascula nondùm vidi: staminum characterem ex auctorum descriptione, confirmante D. Crowe, mutuatus sum. Amenta fœminea longiora et duplo crassiora quam in præcedente, longiùsque pedunculata, squamis oblongis: Germen sessile, ovatum, sericeum. Stylus elongatus, filiformis, glabratus. Stigmata ovata linearia, elongata, patentia, sulcata, emarginata. Capsula ovata, lanuginosa, albidâ.

Amentorum crassitudine, caule erecto arboreo, at præcipuè styli atque stigmatum forma, a priore satis discreta, monente D. Crowe. *Fl. Brit. l. c.*

Ess. Specif. Charact.

One stamen and erect, leaves lance-shaped, acuminate, finely sawed, smooth. Style thread-shaped and elongated, stigmas linear. TR.

Description.

A slender, erect, low tree, scarcely ten feet high. Branches twiggy, round, tough, very smooth; of an ash or purplish colour, and shining. Leaves opposite or alternate, petiolated, linear-lance-shaped, acuminate, thinned on both edges, serrulated or finely sawed near their extremities, smooth, under surface

rather of a sea-green colour, and less bitter than the former. Stipules none. Male catkins not seen; the character of the stamens according to the description of authors, (and which has been confirmed by the observations of Mr. Crowe) has been adopted. Female catkins are much longer and double the thickness of the former, longer peduncles or foot-stalks, and the squamæ or scales oblong. Seed-bud sessile, ovate, and silky. Style elongated, filiform and without hairs. Stigmas ovally linear, elongated, spreading, grooved, and notched. Seed vessels oval, downy, and whiteish. TR.

Observations.

The thickness of the catkins, the erect arborescent appearance, but more particularly the form of the style and stigmas, readily distinguishes it from the former, as stated by Mr. Crowe.

Willdenow tells us that this willow grows in watery situations in Germany, Switzerland and France.

In Flora Britannica in osieries and marshy situations, flowering in March and April.

In English Botany it is mentioned as not uncommon in marshy places, osier holts &c. flowering about the end of March or beginning of April—that it forms a small slender upright tree, with long, tough, very smooth, and polished twigs of a pale yellowish or purplish ash-colour. Leaves (as well as catkins) opposite or alternate on the same plant; the former is a rare circumstance in this genus. Foot-stalks short. Stipulæ none. The form of the leaves is lanceolate, pointed, very much drawn out, as it were, towards the base into a linear shape. This is a distinguishing character. The serratures are slight, and most in the upper part. There is a little pubescence on the youngest leaves only: the older are quite smooth, of a light, somewhat glaucous green. Male catkins, about an inch long, or shortish stalks. Scales concave, tipped with black. Nectary oblong, entire. Stamen one, with 4-lobed anthera. Female catkins thicker and with broader scales. Germen sessile, ovate, silky. Style very perceptibly projecting, smooth, with linear, at length cloven stigmas.

Hoffman and Curtis confounded this with the last. (*S. purpurea.*)

The extreme bitterness of the leaves and twigs of both this and the last renders them

very valuable for many purposes. When used as a band or withe, as the late Mr. Curtis mentions, they are never eaten by vermin; nor when formed into a hedge, are they browsed on by cattle: even insects prey on them much less readily than on the other species. In some parts of Yorkshire, their twigs, particularly of this species are used for making the finest sorts of basket work. Mr. Curtis seems to think it might be advantageously cultivated for such purposes. Planting cuttings of all the common willows one year by way of experiment, he found that this species gave the longest one year's shoot, exceeding even that of *S. viminalis* or *Osier*.

Haller and Ehrhart seem to have led Prof. Hoffman into the error of confounding this species (*S. Helix*) with the preceding, from which, as already remarked, it is unquestionably very distinct, and Haller observes, that the rose-like excrescences are more common at the ends of the branches in this species, whence the name of *rose willow*; he informs us that it is planted about Aigle, to keep up gravelly banks and the shores of rivers.

Mr. Teesdale in the 5th vol. Linnæan Transactions states, that he has observed the following distinctions between this and the

last in their native places of growth. In the month of March, previous to their flowering, the bark of the young shoot of *S. purpurea* is of a dark purple colour, and the scales of the buds are a fine red, almost scarlet, generally tipped with black, and before they drop off they turn wholly black—at the same time, the bark of the young shoots of *S. Helix* is of a yellowish brown, and the scales of the buds are always of a pale brown or chesnut colour.

Desfontaines (Fl. Atlantica) describes the branches very slender, twiggy, purplish now and then, leaves smooth, narrowly lance-shaped finely sawed at times, and quite entire likewise; sea-green-colour underneath, on short petioli or leaf-stalks, the lower leaves alternate, the upper ones opposite—the female and male amenta or catkins slender, the flowers with one stamen, and the down of the ripe seed-vessel long.

Main branches greenish yellow on one side, blackish on the other, shining, striated and grooved—young ramuli or side branches black—leaves alternate and opposite, pointing upwards, acuminate, finely sawed throughout—young ones entire. Stipules long and lance-shaped? Male catkins few, solitary, and bowed. Squamæ very black, ovate and blunt,

with numerous white hairs. Stamina for the most part bending. Female catkins slender, numerous, for the most part alternate, and bowed. Squamæ very small and black, or rather blackish brown at their extremities. Capsules or seed-vessels oblong oval with long foot-stalks, silkily white or shaggy and hairy. Stigmas, bifid, quadrifid and revolute. Nectarium small, melliferous, and glossy at its apex. *Wade.*

XL

SALIX LAMBERTIANA, *Boyton willow*.

Willd. Sp. Plant. 4. 673. Fl. Brit. Sm.
3. 1041. Eng. Bot. v. 19. t. 1359. Don.
Hort. Cant. ed. 3. 178.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. Sm.

Monandra erecta, foliis ovato-lanceolatis
acutis serratis glabris, stigmatibus brevissimis
ovatis emarginatis. *Fl. Brit. l. c.*

Descriptio. Sm.

Magnitudo et forma præcedentis. Folia
subopposita vel alterna, breviora quam præ-
cedente, (vix sesquiuncialia) breviusque peti-
olata, obovata-lanceolata, acuminata, apicem
versùs serrata,, glabra, subtus glaucescentia.

Stipulæ nullæ. Amenta minora quam in *S. Helice*, squamis orbiculatis, nigris. Germen sessile, ovato-ellipticum, crassum, sericeum. Stylus brevissimus. Stigmata parva, ovata, patentia, sulcata, emarginata. *Fl. Brit. l. c.*

Ess. Specif. Charact.

One stamen erect, leaves ovally lance-shaped acute sawed smooth, stigmas very short, ovate, and notched. TR.

Description.

A tree of the height and appearance of the former. Leaves almost opposite, or alternate, scarcely an inch and a half long, shorter than in the former, with short petioli or leaf-stalks, inversely egg-lance-shaped, acuminate, serrated near their extremities, smooth, under-surface rather of a sea-green colour. Stipules none. Catkins smaller than in *S. Helix*, scales orbicular and black. Seed-buds sessile, ovally elliptic, thick and silky. Style very short. Stigmas small, oval, spreading, grooved, and emarginated or notched. TR.

Observations.

In ozier grounds and marshy situations. On the banks of the river Willy at Boyton, Wiltshire, for 16 miles; also in osier-holts near Stains. About Lackford-bridge near Icklingham, Suffolk. Flowers, or produces its catkins in March and April.

This willow, though a very distinct species, and readily to be known, whether in blossom or in leaf, from all others, appears to have been overlooked by botanists as no other than *S. Helix*. Mr. Lambert finds it abundantly near his family seat of Boyton, Wiltshire, and from whom alone Doctor Smith received the male plant. He has observed the same species, in leaf, at Stains. Doctor Smith saw it in the summer of 1804 at Harley-ford not far from Henley upon Thames, and, in company with Mr Crowe, and Sir Thomas Cullum, near Icklingham, Suffolk. It flowers very early in April.

It is most allied to the last (*S. Helix*) and *S. Forbiana* immediately to be noticed; agreeing with the former in having frequently opposite leaves and catkins, and with both in general habit, monandrous flowers, and yellow inner bark. It differs however most

essentially from both in having catkins not half so large and thick, and especially in its stigmas which are short, ovate, notched, and nearly sessile. The young growing branches and leaves much resemble those of a honeysuckle, in their glaucous hue with a purplish tinge in their upper part, which is more or less downy. The leaves are of a broad lanceolate figure, dilated above the middle, about half as long as those of *S. Forbiana* and broader, as well as shorter, than those of *S. Helix*. Doctor Smith could never discern any stipulæ. The present plant is perhaps scarcely inferior to the next to be considered (*S. Forbiana*) as an osier, and much more common.

In its young state, the leaves look like *Myrica Gale*, or sweet gale—the female catkins are few, opposite, sessile, and pendant.

XLI.

SALIX FORBYANA, basket osier.

Willd. Sp. Pl. 4. 674. Trans. Lin. Soc.
v. 6. 115. *Salix fissa*, excluso synonymo. Fl.
Brit. Sm. v. 3. 1041. Eng. Bot. v. 19. t.
1344.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. SM.

Monandra erecta, foliis substipulatis lanceolatis acutis denticulatis glabris subtùs glaucis, stigmatibus linearibus. *Fl. Brit. l. c.*

Descriptio. SM.

Rami viminei, erecti, flexiles et valdè tenaces, glabri, cinereo-lutei, vel purpurascentes. Folia alterna, rariùs supposita, petiolata, lanceolata, acuminata, bi-vel tri-uncialia, apicem

versus præcipue denticulata vel subserrata, utrinque glaberrima suprà saturatè viridia; subtùs glauca; juniora parùm pubescentia. Stipulæ parvæ, lanceolatæ, acutæ, rariùs obviæ. Amenta brevius pedunculata. Magnitudine et forma *S. Helicis*. Squamæ obovatæ, nigrae, quandoque emarginatæ. Germen sessile ovatum, sericeum. Stylus elongatus. Stigmata ovato-linearia, emarginata, patentia.

Flosculum unnum vel alterum, masculinum, monandrum, ad basin amentorum foemineorum quandoque inveni.

Ad corbes concinniores texendas præstantissima est hæc species. *D. Crowe. Fl. Brit. Sm. l. e.*

Description.

Branches twiggy, erect, pliant, and very tough, smooth, of an ash-coloured yellow, or purplish. Leaves alternate, rarely somewhat opposite, petiolated, lance-shaped, acuminate, two or three inches long, towards their extremities principally denticulated or somewhat serrated, very smooth on both sides; upper surface of a deep green, underneath of sea-green colour, the very young leaves pubescent. Stipules small, lance-shaped, acute,

seldom discoverable. Catkins with short peduncles, the size and form of the rose-willow, (*S. Helix*) scales inversely oval, black, in time becoming notched. Seed-buds sessile, ovate, and silky. Style elongated. Stigmas ovally linear, emarginated and spreading. TR.

Observations.

One or two little male monandrous flowers are now and then to be met with, at the base of the female catkins.

According to the observations of Mr. Crowe, this willow is in high estimation for making the better kinds of baskets or panniers.

Found in sallow grounds, flowering in April. At Fincham, Norfolk. In several osier-grounds near Lynn, Norfolk. At Prickwillow, near Ely.

This shrubby willow, which is so highly valuable, as an osier, for the finer kinds of basket work, and on that account greatly preferred to the rose-willow (*S. Helix*) was first sent to Mr. Crowe, by the late Rev. Joseph Forby, from Fincham, Norfolk. It has since been found in many places in Cambridgeshire. Doctor Smith had long thought it Hoffman's *S. fissa*; but authentic specimens

of that at length undeceived him; neither is the stamen cloven, but simple and monandrous as in *S. Helix*. Doctor Smith once luckily found 1 or 2 male flowers at the base of a female catkin, which served to decide this point; for the true male plant he never saw. The name may serve to commemorate the original discoverer or more especially his brother the Rev. Robert Forby, an able botanist.

The leaves in this, as observed before, are alternate, rarely opposite, truly lanceolate, pointed, of a darker green above, and more thickly toothed or serrated, than in the last; glaucous beneath. Stipulæ small, lanceolate, acute, often wanting. Catkins sessile, so very like in all their parts to *S. Helix* that they can hardly be distinguished, but the leaves afford sufficient marks of difference, and the quality of the twigs renders the plant well worth observation.

Branches yellowish green, leaves alternate, when full grown erect, with a reddish midrib. Stipules linear and denticulated. Female catkins many, blunt, alternate, erect, and rather slender. Squamæ obtuse, black and very hairy. Germen small. Style small, but elongated. Stigmas bifid or bifurcated. Nectarium very small, with a very short foot-stalk.
Wade.

XLII.

SALIX RUBRA, green osier.

Willd. Sp. Pl. 4. 674. Trans. Lin. Soc. v. 6. 166. Villars. Dauph. v. 3. 785. t. 51. f. 30. *S. virescens*. Ehrhart, Arb. 29. *S. fissa*. Fl. Brit. Smith. v. 3. 1042. Eng. Bot. v. 16. t. 1145.

Charac. Ess. Specif. SM.

Monadelphæ? foliis lineari-lanceolatis elongatis acutis denticulatis glabris; subtus concoloribus. *Fl. Brit. l. c.*

Descriptio. SM.

Rami viminei, longissimi, tenaces, glabri, cinerei, vel purpurascens. Folia alterna, petiolata, lineari-lanceolata, acuta, quadriunciala, denticulata vel serrulata, nequaquam integerrima, utrinque lætè viridia, glabra, vel subtus rariùs obsoletè pilosa. Stipulæ lineari-lanceolatæ, denticulatæ, sæpius vero nullæ.

Amenta masculina nondum vidi, fœminea ferè ut in præcedente, sed stigmatibus aliquantulum crassioribus et ferè ovatis.

Differt a *S. Lambertiana* foliis longioribus, duplòque angustioribus, figurâ ferè *S. viminalis* at utrinque lætè viridibus, neque glaucis neque incanis. Folia juniora reverà pubescunt ut in aliis speciebus. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

Monadelphous? leaves linear-lance-shaped, elongated, sharp, denticulated, smooth, underneath of the same colour, with the upper surface. TR.

Description.

Branches vimineous or twiggy, very long, tough, smooth, ash-coloured or purplish. Leaves alternate, foot-stalked, linear lance-shaped, acute, four inches long, denticulated or finely sawed, by no means very entire, a bright green on both surfaces, smooth, or rarely on their under surface obsoletely or obscurely hairy. Stipules linear-lance-shaped, toothed, but very frequently none. Male catkins have not as yet been seen; female catkins almost the same as on the former, (*S. Forbyana*) but the stigmas are somewhat thicker, and almost oval. TR.

Observations.

It differs from the Boyton willow (*S. Lambertiana*) in their leaves being longer, half as narrow again, the form almost of the common osier (*S. viminalis*) but bright green on both surfaces of the leaves, neither glaucous, nor hoary. The young leaves are truly pubescent, as in every other species.

Willdenow, who examined the living female plant, states that it grows in Germany.

It is of rare occurrence in osieries in England. Between Maidenhead and Windsor and near Salisbury. In an osier holt near Ely. At Prickwillow, near Ely. In Cambridgeshire. Near Bedford.

Gathered by the Rev. Mr. Hemsted, between Prick-willow and Ely, also at Icklingham, Suffolk. (Eng. Bot. l. c.)

It is a slender tree of moderate height, when not cut down as an osier, flowering in April or early in May. The branches as already observed are long, slender, tough and pliant, smooth, of a greyish or purplish hue. Leaves alternate, on short slender foot-stalks,

linear-lanceolate, acute, flat, 3 or 4 inches long, very minutely toothed or serrated, grass-green, and smooth on both sides, the young ones only being downy as in most species. The stipulæ but very rarely occur; they are linear-lanceolate and toothed. Female catkins not an inch long, obtuse; their scales elliptical, hairy, purple. Germen ovate, acute, sessile, silky, with a very short style, and ovate thick stigmas. Nectary a yellow, cylindrical, abrupt gland at the base of the germen. The male plant Doctor Smith never saw, but from analogy the stamina are presumed to be monadelphous, and he thinks it most useful in this obscure genus to publish but one sex (as the leaves and habit never differ) rather than wait in the vain hope of obtaining both sexes of every species, which can only be the result of many years' laborious research.

S. rubra is among the most valuable osiers, though little known as yet to botanists. Ehrhart gives it in his dried plants as *S. fissa* of Hoffman; to which Doctor Smith cannot assent.

The name *rubra* is less apposite than might have been wished; *virens* or *concolor* would better have expressed the peculiar character of the species. *Smith.*

XLIII.

* **SALIX CROWEANA**, *broad-leaved monadelphous willow.*

Willd. Sp. Plant v. 4. 675. Trans. Lin. Soc. v. 6. 117. Fl. Brit. Smith. v. 3. 1043. Eng. Bot. v. 16. t. 1146.

HORTUS GLASNEVINENSIS. IV. VI. VII.

Charact. Essent. Specif. SM.

Monadelpha, foliis ellipticis subserratis glaberrimis subtus glaucis. *Fl. Brit. l. c.*

Descriptio. SM.

Rami breves, patuli, fragiliores, luteoli vel purpurascens, nitidi. Folia alterna, petiolata, patentia, vix sesquiuncialia, elliptica, vel ovata elliptica, acutiuscula, obsolete serrata, vel subcrenata, utrinque glaberrima;

supra læte viridia, nitida; subtus glauca, venosa. Amenta subsessilia, ovato-cylindracea, brevia. Squamæ obovatæ, nigræ, pilosissimæ. Stamina citrina, elongata, filamentis plùs minùs connatis, antheris rubicundis. Flores fœmineis adhuc desiderantur. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

Monadelphous, leaves elliptic, subserrated, very smooth, underneath sea-green colour.
Tr.

Description.

Branches short, spreading, brittle, yellowish or purplish, and shining. Leaves alternate, foot-stalked, spreading, scarcely an inch and a half long, elliptic, or ovably elliptic, somewhat acute, obsoletely serrated, or somewhat notched, very smooth on both surfaces; upper one of a bright green, and shining; underneath glaucous and veiny. Catkins somewhat sessile, ovably cylindrical and short. Scales inversely egg-shaped, black, and very hairy. Stamens of a citron colour, elongated; the filaments more or less united at their base, or monadelphous, antheræ very

red. The female catkins] are as yet unknown. TR.

Observations.

Found in marshy situations, flowering in April and May. At Cranberry Fen, in the parish of East Winch, and in other parts of Norfolk.

As far as Doctor Smith has been able to ascertain, this is a perfectly non-descript species of willow, the only one with united stamina and short broad leaves, to which Doctor Smith has given the name of its discoverer, James Crowe Esq. F. L. S. who has observed it in several parts of Norfolk flowering in April or May. It forms a small irregularly growing tree, with short, brittle, yellow or purplish, divaricated branches. Leaves alternate, on broad stalks, spreading, hardly an inch and a half long, elliptical or somewhat obovate, acute, edged with numerous tough slight serratures; smooth, on both sides; bright, shining, green above, glaucous and veiny beneath; their points in maturity reflexed and often split. Male catkins ovate, short, and of a bright yellow when young. Scales obovate, hairy, tipped with black. Filaments more or less united at their base.

Antheræ orange-coloured. The female catkins have never been met with, but they are not wanted to discriminate this very distinct species.

This *Salix* is of no use as an osier, nor has Doctor Smith seen it any where cultivated. When in blossom it is one of the most ornamental, and the leaves are not destitute of beauty.

It possesses none of the valuable properties of an osier, having short and rather brittle, not long, and flexible twigs, and, as before observed, to all appearance has never been cultivated, but is truly wild in Norfolk. *Smith.*

Branches blackish. Male catkins oblong or cylindrical. Squamæ obtuse and blackish brown at their apex. One large, erect, stout, wedge-shaped, or rather club-shaped cloven stamen, with anthers replete with pollen, some of which are covered with a kind of capsule—a few florets with two stamina, or rather so much cloven as to appear like two; others completely and beautifully *monadelphous* almost to the very antheræ. Nectarium small, and exuding a sweet clammy juice. *Wade.*

As the female of this willow has not been seen by Doctor Smith, and therefore not described by him in *Flora Britannica* or *English Botany*, some doubts naturally arise, whether a shrub growing in the Society's Botanical Garden, bearing female catkins, and similar in foliage &c. to the male shrub just described, should be considered as the real *S. Croweana* *foem*?—however some account of its fructification, even if it is not the plant, can do no material injury, and may be easily rectified at some future day—indeed much latitude for surmise and doubt must be allowed in this intricate genus, or class of plants.

It produces its buds, leaves, and catkins late in the season (June and July.) The amenta or catkins are small, narrow and close, white, and very soft. Squamæ or calyx scales, small, blackish brown from the middle upwards, ciliated, and very hairy. Germen or seed-bud, small, broad, foot-stalked, cylindrical, and covered with silvery white hairs. Style elongated. Stigmas quadrifid, and yellowish. Nectarium very small, broad, yellow, and shining.

The capsules or seed-vessels in their very ripe state, remarkable during the time of their bursting—the valves completely rolled back.
Wade.

XLIV.

SALIX DIVARICATA, Daurian willow.

Willd. Sp. Pl. 4. 675. Fl. Ross. Pallas.*
2. p. 80.

Description.

Caulis crassitie digiti vel pollicis ab ipsa radice dichotomo ramosissimo, ramis brevissimis, rigidis, divaricatis terræ adpressis luteofuscis. *Folia* in extremis ramis crebra, in quibusdam lanceolata, integriuscula, in aliis fruticibus ovato-lanceolata grossius serrata, serraturis subundulatis, obtusis, cæterum glaberrima exstipulata. *Amenta* fœminea inter folia subsessilia aphylla vix pollicaria confecta pappum densum fundentia. *Pallas. l. c.*

* Flora Rossica, edidit P. S. Pallas. Tom. 1. Pars 1. & 2. Petropoli, 1784, 1788. fol.

Description.

Trunk or stem arising from the root, the thickness of the finger or thumb, dichotomous, and very branching, the branches very short, rigid, spreading, of a yellowish brown colour, and pressed close to the ground. Leaves in the extremities of the branches very close together, in some shrubs lance-shaped, somewhat entire, in others ovally lance-shaped, thickly serrated, the serratures somewhat undulated or waved, obtuse, in all other respects very smooth and without stipules. Female catkins somewhat sessile between the leaves, and not leafy, scarcely an inch long, and yielding a dense pappus or down. TR.

Observation.

Found on the highest mountains of Dauria.

On Sochondo one of the loftiest mountains of Dauria, spreading itself on the granite rocks.

XLV.

SALIX MALIFOLIA, *apple-leaved willow*.

Willd. Sp. Plant. 4. 676. Fl. Brit. Sm.
3. 1053. Eng. Bot. v. 23. t. 1617.

Charact. Ess. Specif. Sm.

Foliis elliptico-oblongis dentatis repandis
scariosis glaberrimis, stipulis cordatis maxi-
mis. *Fl. Brit. l. c.*

Description. Sm.

Species distinctissima, habitu Pyri ejus-
dam aut Mali, notabilis. Caulis tripedalis,
ramosus, erectus. Rami nigricantes; juniores
hirti. Folia biuncialia alterna, brevius petio-
lata, elliptico-oblonga, acutiuscula, undique et
crebrè dentata, plus minùs undulata vel re-
panda, scariosa, rigidula, utrinque glaberrima,
suprà læte viridia; subtùs glaucescentia, ve-
nosa, venis divaricatis, anastomosantibus, pal-

lidis, nervo albido aut basi rubicundo. Petioli crassi, basi latissimi, stipulæ magnæ cordatæ vel semicordatæ recurvæ, dentatæ, venosæ, colore foliorum. Variat foliis basi productis. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

Leaves elliptically oblong, toothed, wavy, scaly, very smooth, stipules heart-shaped and very large. TR.

Description.

This is a very distinct species of *Salix*, remarkable for being like some species of apple or pear trees. The trunk is three feet in height, branching and erect. The branches blackish, when young hairy. Leaves two inches long, alternate, with short petioli or foot-stalks, elliptically oblong, somewhat acute, thickly dentated, on both edges wavy and scaly, somewhat stiff, and very smooth on both surfaces, upper one bright green, underneath rather of a sea-green colour, veiny, and the veins divaricated, anastomosing, pale, the middle nerve whitish or very red at its base. Leaf-stalks thick and very broad at their base. Stipules large, heart or half-

heart-shaped, recurved or bent backwards, toothed, veiny, and the colour of the leaves.

Tr.

Observations.

It varies in having its leaves drawn out at their base. Gathered by Mr. Crowe in England, what particular spot is unknown.

This gentleman, who has for many years been in the habit of taking cuttings of willows, in his rides about Norfolk and Suffolk more especially, wherever he found them, in order to cultivate and investigate them at leisure, has by this means several whose precise places of growth he could not recollect. The present plant is so circumstanced; but Mr. Crowe thought he found it wild in some part of Norfolk, and from the habit Doctor Smith would suppose it an upland species. He informs us, that it forms a spreading shrub 3 or 4 feet high, blossoming in April, and when in leaf (as before observed) is very remarkable for having somewhat of the habit of an apple tree. The twigs are crooked, brittle, of no use, hairy when young, blackish. Leaves on short thick stalks, 2 inches long, smooth, veiny, obovate, or elliptical, pointed, their margin waved and closely toothed, their under side glaucous; their sub-

stance thin, harsh and crackling. Stipulas large, recurved, heart-shaped, toothed. Female catkins an inch long, erect, thick, obtuse; their scales roundish, entire, clothed with long dense soft hairs. Germen long and tapering, smooth. Style not half so long as the germen, with a short simply divided stigma.

Doctor Smith has no doubt that this *Salix* is new to Britain—he observes that there is some difficulty in distinguishing it from the exotic *S. hastata*, but the latter is a considerable tree, with a more erect habit, broader less undulated leaves, and rather larger catkins. They seem to differ nearly as *S. caprea* and *aquatica* do from each other, but Doctor Smith leaves the matter to future decision.

XLVI.

SALIX RHAMNIFOLIA, *buck-thorn-leaved
willow.*

Willd. Sp. Pl. 4. 677. Fl. Ros. Pallas.
2. p. 84.

Descriptio. SM.

Virgæ vix pedales spadiceæ subramosæ.
Folia glaberrima ovata versus petiolum ma-
gis producta, apice rotundata, obtuse serrata
seu crenulata, subtus magis minusve glauca.
Fl. Ros. l. c.

Description.

The twigs are scarcely a foot long, spadiceous, and somewhat branching. Leaves very smooth, oval, and particularly drawn out towards their petioli or stalks, rounded off at their summits, obtusely serrated or

slightly notched, their under surfaces more or less of a sea-green colour. TR.

Observation.

Found on subalpine marshy situations in Siberia from the river Obo to lake Baical.

XLVII.

SALIX STARKEANA, Willdenow.—Starke's willow.

Willd. Sp. Pl. 4. 677.

Charact. Ess. Specif.

Foliis orbiculato-ellipticis medio subserratis glabris subtus glaucescentibus, amentis serotinis, capsulis ovato-lanceolatis pedicellatis pubescentibus.

Description.

Rami flavo-fusci. *Folia* sesquipollicaria orbiculato-elliptica, obtusissima, sæpius integerrima,

quandoque medio remote serrata, rarius a medio ad basin remote serrata, utrinque glabra, supra læte viridia, subtus glaucescentia. Juniora subtus subpilosciuscula. *Stipulæ* parvæ ovatæ dentatæ. *Amenta* mascula quadrilnearia cylindracea tenuia, squamis lanceolatis pilosis. *Filamenta* alba squamis multo longiora. *Antheræ* subrotundæ flavæ. *Amenta* fœminea vix pollicaria, fructifera pollicaria et longiora. *Squamæ* lanceolatæ pilosæ. *Stylus* brevis bifidus. *Stigma* bifidum. *Capsulæ* ovatæ lanceolatæ longissime pedicellatæ pubescentes Willdenow. l. c.

Ess. Specif. Charact.

Leaves orbicularly elliptic, somewhat serrated towards the middle, smooth, their under surface of a sea-greenish colour; catkins appearing late; seed-vessels ovally lance-shaped, foot-stalked, and pubescent. TR.

Description.

Branches of a yellowish brown colour. Leaves an inch and a half long, orbicularly elliptic, very obtuse, and frequently very entire, after some time they become remotely serrated towards the middle, more

rarely remotely serrated from the middle to the base, smooth on both surfaces, upper one of a bright green, underneath of a sea-greenish colour. The young leaves are somewhat hairy on their under surface. Stipules small, oval and dentated. Male catkins four lines long, cylindrical and slender; scales lance-shaped, and hairy. Filaments white, much longer than the scales. Antheræ somewhat round and yellow. Female catkins scarcely an inch long, in an advanced state, when the seeds become ripe, they assume the length of an inch and upwards. Scales, lance-shaped and hairy. Seed-buds lance-shaped, pubescent or woolly. Style short, and cloven. Stigma bifid. Seed-vessels ovally lance-shaped, with very long foot-stalks, and pubescent. TR.

Observation.

Willdenow, who examined this willow in a dry state, informs us that it grows in marshy situations in Silesia.

XLVIII.

SALIX PRUNIFOLIA, *plum-leaved willow*.

Willd. Sp. Pl. 4. 678. Hoffman. Sal. v. 1. t. 19. et t. 24. f. 2. *Salix myrsinites*.—
Fl. Brit. Sm. 3. 1054. Eng. Bot. v. 19. t. 1361.

Charac. Ess. Specif.

Foliis ovatis serratis glabris, supra lævibus; subtùs glaucis, ramulis subpubescentibus, capsulis ovatis sericeis. *Fl. Brit. l. c.*

Description.

Caulis tripedalis, ramosissimus. Rami patentes, sæpè rubicundi, foliosi, apice pubescentes, pilis brevissimis curvis. Folia uncialia, alterna, petiolata, ovata, acuta, nitida; subtùs glauca, venosa, opaca, et subsericea, imprimis juniora atque inferiora. Stipulæ

exiguæ, semiovatæ, dentatæ, sæpè nullæ. Amenta e ramulis lateralibus brevioribus, solitaria, erecta, triplò quam in *S. myrsinite* tenuiora, et longitudine vix uncialia, squamis subrotundis, extùs hirsutis. Capsulæ duplò minores quam in *S. myrsinite*, ovatæ, undique sericeo-pilosæ, demum glabriusculæ, badiæ. Stylus brevis. Stigmata parva bipartita.

Varietatem, ut videtur, foliis omnibus subtùs sericeis ex amicissimo D. Stuartio accepi. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves ovate, sawed, smooth, upper surface bare; underneath sea-green, the young branches somewhat hairy, seed-vessels ovate and silky. TR.

Description.

The trunk three feet high, and very branching. Branches spreading, frequently deep red, leafy, pubescent at their extremities, with very short crooked hairs. Leaves an inch long, alternate, petiolated, oval, acute,

and finely sawed on both edges; upper surface deep green, smooth, without hairs, and shining, underneath sea-green colour, veiny, opaque, somewhat silky, principally in the young and inferior leaves. Stipules very small, semioovate, toothed, frequently none. Catkins proceed from the short lateral branches, solitary, erect, three times as slender as in *S. myrsinites*, and scarcely an inch long, scales almost round, externally hairy. Seed-vessels half the size of those in *S. myrsinites*, oval, covered on all sides with a silky hairiness, at length they become somewhat smooth, and of a brown colour. Style short. Stgmas small, and cloven in two. Tr.

Observations.

It appears that there is a variety of this willow with all the leaves silky underneath.

This shrubby willow flowers in May and June, and has been found by the Rev. Mr. Stuart and Rev. Doctor Walker in several parts of the Highlands. *Fl. Brit. l. c.*

Doctor Smith in his English Botany states, that his figure was taken from the very shrub sent by the late Mr. Lightfoot as his

S. myrsinites, and growing in the late Mr. Crowe's garden. He observes that it agrees moreover with his specimens at Frogmore, and seems not to be rare on the Scottish mountains.

The stem is often 3 feet high, but less constantly erect than in *S. myrsinites*, and its branches are commonly more lax, spreading and elongated; the young ones clothed with soft curved down, not rigid prominent hairs. Leaves larger, ovate, flat, serrated; quite smooth, green and shining, without any prominent veins on the upper side; glaucous, veiny, and often silky beneath. Stipulæ very minute, half ovate, convex, notched, often wanting. Catkins from short lateral branches, erect, cylindrical, not half so thick as in the real *myrsinites*, with round, very hairy or silky scales. Nectary oblong. Capsules smaller than in that species, ovate, clothed with silky hairs, at least while young. Stigmas short thick and roundish, cloven.

XLIX.

SALIX WEIGELIANA, *Willdenow—Weigel's.—*
willow.

Willd. Sp. Plant. 4. 678.

Charact. Ess. Specif.

Foliis ellipticis acutis apice dentatis basi integerrimis glabris subtus glaucescentibus, amentis subpræcocibus, germinibus oblongis sericeo-hirsutis, stylis elongatis.

Descriptio.

Rami fusi. *Folia* sesquipollicaria et majora, elliptica, breve acuminata, a medio ad apicem dentata, basin versus integerrima, supra nitida læta viridia, subtus pallidiora glaucescentia, præsertim juniora, utrinque glabra.

Stipulæ parvæ lanceolato-subulatæ subintegerimæ. *Amenta* fœminea pollicaria demum sequipollicaria, cylindræa, mascula nondum vidi. *Squamæ* lanceolatæ pilosæ. *Germina* oblonga, dense pilis albis sericeis tectis. *Stylus* elongatus ad medium usque bipartitus. *Stigma* profunde bipartitum. *Willdenow l. c.*

Ess. Specif. Charact.

Leaves elliptic, acute, dentated at their extremities, very entire at their base, underneath sea-greenish colour; catkins appearing somewhat early; seed-vessels oblong, covered with a silky hairiness, styles elongated. TR.

Description.

Branches brown. Leaves more than an inch and a half long, elliptic, shortly acuminate, from their middle to their extremity toothed, towards their base very entire, upper surfaces shining, and bright green, underneath more pale, and sea-greenish, particularly the young leaves, smooth on both surfaces. Stipules small, lance-awl-shaped, somewhat entire. Female catkins

an inch, and ultimately an inch and a half long, cylindrical; male catkins have not as yet been seen. Scales lance-shaped, and hairy. Seed-buds oblong and densely covered with white silky hairs. Style elongated and slit down through the middle. Stigma deeply slit, or cloven in two.
Tr.

Observation.

Willdenow, who examined the female plant only, and that in a dry state, informs us that it grows on the Silesian mountains.

L.

SALIX MYRSINITES, *green whortle-leaved
willow.*

Willd. Sp. Pl. 4. 678? Fl. Lapp. ed. Smith.
293. t. 8. f. f. t. 7. f. 6. Villars. Dauph.
v. 3. 769. t. 50. f. 12. Fl. Danic. t. 1054.
Hoff. Sal. v. 1. 71. t. 18. Dicks. Trans.
Lin. Soc. v. 2. 288. *S. retusa*. Fl. Brit.
Sm. v. 3. 1054. Eng. Bot. v. 19. t.
1360.

HORTUS GLASNEVINENSIS. III. IV.

Charac. Ess. Specif. SM.

Foliis ellipticis serratis glabris venosis
utrinque nitidis, ramulis hirtis, capsulis sub-
ulatis pubescentibus. *Fl. Brit. l. c.*

Description. S.

Caulis pedalis vel bipedalis, ramosissimus. Ramuli divaricati, densè foliosi, hirti, pilis porrectis, apice floriferi. Folia alterna, brevius petiolata, vix uncialia, elliptica, undique serrulata, rigidula, marescentia, reticulato-venosa, utrinque læte viridia, nitida, nequaquam glauca; inferiora obtusa; juniora subsericea. Stipulæ serratæ, glabræ, forma ac magnitudine maximè variæ. Amenta terminalia erecta, solitaria, pedunculata, crassa, obtusa, densa, squamis obovatis, obtusis, pilosis, rariùs denudatis. Antheræ plumbeæ. Capsulæ subulatæ, pube molli, brevi, densâ vestitæ, demum ferè glabratae. Stylus elongatus, glaber. Stigmata magna, bipartita. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves elliptic sawed smooth veiny, shining on both surfaces, young twigs hairy, seed-vessels awl-shaped and pubescent. Tr.

Description.

A foot or two high, and very branching. Branches divaricated or straddling, thickly

covered with leaves, hairy, the hairs extended, and floriferous or bearing catkins at their extremities. Leaves alternate, with short foot-stalks, scarcely an inch long, elliptic, finely sawed on both edges, somewhat stiff, withery looking, reticularly veiny, both surfaces bright green, shining, by no means glaucous; inferior ones obtuse, and the young leaves somewhat silky. Stipules sawed, smooth, differing greatly as to size and form. Catkins terminate the branches, erect, solitary, foot-stalked, thick, blunt, compact; scales inversely egg-shaped, obtuse, hairy, more rarely without hairs. Antheræ of a leaden colour. Seed-vessels awl-shaped covered with a soft, short, dense down; at length they become almost smooth. Style elongated, and smooth. Stigma large and cloven in two. TR.

Observations.

Found on the Highlands of Scotland. Mountains of Glenco. Willdenow observes that it is to be found on the Lapland mountains, and those of Switzerland, Italy and France.

According to Doctor Smith, specimens of this willow were gathered by Mr. Stuart on

the mountains of Glenco, a spot too celebrated in the reign of King William III. which prove this species to be British. These specimens are in Mr. Lightfoot's herbarium, and he has written upon them "I take this to be *S. myrsinites* rather than that I had before" in which Doctor Smith says he is right. His own *myrsinites* however (Doctor Smyth's *prunifolia*) has till lately gone by that name among the British botanists; and hence Mr. Dickson, who also found the true one in Scotland, took that for *retusa*. Both, Dr. Smith observes, are confounded together by Hoffman, because he received them both as *myrsinites* from his correspondents.

Doctor Smith further states, that the true British is a little sturdy upright shrub, scarcely two feet high, with numerous short thick divaricated branches, hairy when young. It blossoms in April, May, or even June. The leaves are rigid, shining, elliptical, broad, serrated, recurved, very green, veiny; their withered skeletons often remain on the branches through winter. The young leaves are a little silky. Stipulæ serrated, smooth, spreading, often very large. Catkins terminal, erect, thick and obtuse, purplish. Antheræ bluish. Scales obovate. Nectary notched. Capsule tapering, downy when young. Stigmas oblong, cloven.

The female catkins appear to be ovate-oblong, small, and hairy. Squamæ or calyx scales obtuse or rather truncated, variegated, and hairy. Germen, or seed-bud inversely egg-shaped and woolly. Style elongated and bifid, reddish. Stigmas bifid, and very red. Nectarium small, broad, and extremely red at its apex. *Wade.*

LI.

SALIX WALDSTEINIANA, *Willdenow.*—*Waldstein's, or Croatian willow.*

Willd. Sp. Plant. 4. 679.

Charact. Essent. Specif.

Foliis obovato-ellipticis medio serratis acutiusculis, glabris, supra nitidis, subtus glaucescentibus, amentis coetaneis, germinibus lanceolatis, sericeo-pubescentibus.

Descriptio.

Rami fusci, juniores glabri. *Folia* semipollicaria vel majora, obovata-elliptica, apice rotundato-acutiuscula, medio remote serrata, basi apiceque integerrima, interdum ex toto fere integerrima, glabra, supra nitida, subtus glaucescentia, juniora subtus pilis adpressis sericeis obsita. *Stipulae* lanceolatae parvae. *Amenta* mascula semipollicaria. *Squamæ* lanceolatae nigricantes pilosæ. *Germina* lanceolata sericeo-pubescentia alba. *Stylus* medio-cris bifidus. *Stigmata* emarginata.

Valde affinis præcedenti sed diversa: ramis junioribus glabris, foliis subtus glaucescentibus ovato-ellipticis, medio tantum remote serratis, antheris flavis, germinibus exacte sessilibus nec breve pedicellatis. *Willdenow. l. c.*

Ess. Specif. Charact.

Leaves ovally elliptic, serrated in the middle, somewhat acute, smooth, upper surfaces shining, underneath sea-greenish; catkins

appearing late; seed-buds lance-shaped, and covered with a silky pubescence. TR.

Description.

Branches brown, the young ones smooth. Leaves above half an inch long, inversely egg-elliptic-shaped, rounded off at their summits and acute, in the middle remotely serrated, very entire at their base and apex, sometimes almost very entire altogether, smooth, shining above, underneath sea-greenish, the young leaves covered underneath with silky pressed down hairs. Stipules lance-shaped, and small. Male catkins half an inch long. Scales lance-shaped, blackish and hairy. Seed-buds lance-shaped and covered with a white silky pubescence. Style of a middling size, and bifid. Stigmas notched. TR.

Observations.

Bears a great resemblance to the former (*S. myrsinites*) but a different willow—the young branches are smooth, the leaves underneath sea-greenish, ovals elliptical, in the middle only remotely serrated, the an-

theræ yellow, seed-buds exactly sessile, not furnished with short foot-stalks. TR.

Willdenow, who examined this species of willow in a dry state, informs us that the Croatian Alps is its native place of growth.

LII.

SALIX FORMOSA, Willdenow.—*Carinthian willow.*

Willd. Sp. Plant v. 4. 680. *S. venulosa*
Fl. Brit. Sm. 3. 1055 ? *S. alpina* Scopol.
Carniol. n. 1208. t. 61 ?

Charact. Ess. Specif.

Foliis oblongis acutis medio serratis, margine ciliatis glabris, supra nitidis reticulato-venosis, subtus glaucis, amentis coetaneis, capsulis lanceolatis sericeo-villosis.

Descriptio.

Rami rufo-fusci. *Folia* pollicaria et longiora, oblonga, acuta, basi parum angustata, medio remote serrata, basi apiceque integerri-
ma, utrinque glabra, supra nitida, reticulato-
venosa, subtus glauca, margine tenuissime
ciliatæ. Juniora folia subtus pilis copiosissimis
sericeis adpressis tecta, adulta glabra, subtus
glauca, sero autumnno glauco evanescit, et
tantum subtus pallida evadent. *Stipulae* lan-
ceolato-subulatæ minutissimæ. *Amenta* fœ-
minea vix pollicaria. *Squamæ* lanceolatæ mar-
gine ciliatæ. *Germina* lanceolata sericeo-villosa
alba. *Stylus* brevis bifidus. *Stigmata* obtusa
bifida. *Willdenow. Sp. Pl. l. c.*

Ess. Specif. Charact.

Leaves oblong, acute, sawed in the mid-
dle, ciliated on their margins, smooth, upper
surface shining, and reticulated with veins,
underneath glaucous; catkins appear late; cap-
sules or seed-vessels lance-shaped, and covered
with a silky shaginess. TR.

Description.

Branches reddish brown. Leaves above
an inch long, oblong, acute, a little narrowed
at their base, in the middle remotely serrated,

their base and extremities very entire, smooth on both surfaces, upper one with reticulated veins, underneath glaucous, their margins most delicately ciliated or eyelashed. The young leaves covered with a large quantity of pressed down silky hairs, in a more advanced state completely smooth, underneath glaucous; late in the autumn this glaucous or sea-green colour disappears, and then they become pale. Stipules lance-awl-shaped, and very minute. Female catkins scarcely an inch long. Scales lance-shaped and ciliated on their margins. Seed-buds lance-shaped, of a silky shaggy whiteness. Style short and cloven in two. Stigmas obtuse and bifid. Tr.

Observation.

Willdenow examined the female of this willow in a recent state; and he informs us, that it grows on the Helvetic and Carinthian Alps.

LIII.

SALIX VENULOSA, *veiny-leaved red willow.*

Fl. Brit. Smith. v. 3. 1055—Eng. Bot. v. 19. t. 1362.

Charact. Ess. Specif.

Foliis ovatis serratis glabris, suprâ reticulato-venosis, subtùs glaucescentibus; capsulis. *Fl. Brit. l. c.*

Description.

Forma *S. prunifoliæ*; discrepat verò foliis suprâ concinne venulosis, venis prominentibus, parallelis, marginem versùs reticulato-anastomosantibus, subtus pallidè viridibus, minùsque glaucis. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves ovate sawed smooth: upper surface reticularly veiny; underneath sea-greenish; seed-vessels. . . . TR.

. . . . Capsules elliptical, silky. ENG. BOT.

Description.

This willow bears a resemblance to the plum-leaved willow (*S. prunifolia*,) it differs however in the leaves on their upper surface being beautifully streaked with delicate veins, which are prominent, parallel, and towards the margin reticularly anastomosing; underneath pale green, and less glaucous. TR.

Observations.

Doctor Smith confesses his obligations to Mr. Crowe for first remarking the difference between this, and the *S. prunifolia*. It was collected, with many others, by Mr. Dickson in the highlands of Scotland, and Mr. Winch has received specimens from the

same place. It flowers either late in April or early in May.

Doctor Smith further observes, that in size and general habit, as well as in the stipulæ, this closely accords with *S. prunifolia*; but the leaves differ materially in having their upper surface always elegantly reticulated with a number of prominent veins, especially towards the margin. These are very apparent in the dry as well as in the living leaf. The under surface is less glaucous in general than in the *S. prunifolia*, but this character varies. The fructification also differs. The catkins are rather more slender; their scales ovate and obtuse; capsules smaller, elliptical, rather than ovate, more silky, with a shorter style; the stigmas agree.

There are several specimens in Mr. Lightfoot's herbarium, which, by their capsules, seem to belong to this species.

XLIV.

SALIX CARINATA, *folded-leaved willow*.

Wild. Sp. Pl. 4. 680.—Fl. Brit. Smith.
v. 1055.—Eng. Botany v. 19. t. 1363.

HORTUS GLASNEVINENSIS. V.

Charact. Ess. Specif.

Foliis ovatis denticulatis glabris compresso-
carinatis tenuissimè venulosis.

Descriptio.

S. prunifolia et venulosa, paulò major et
erectior. Rami juniores vix pubescentes,
stricti. Folia sesquiuncialia, brevius petiola-
ta, ovato-elliptica, acuta, denticulata, nec
serrata, arcuato-recurva, compresso-carinata;
supra viridia, nitida, tenuissimè venulosa,
subtùs pallidiora, opaca, vix glauca; utrin-
que glaberrima; juniora subtùs obsoletè se-
ricea. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves ovate, finely toothed, smooth, compressly keeled, and most delicately veiny.

..... Capsules ovate, downy. ENG. BOT.

Description.

This species of willow is somewhat larger and more erect than *S. prunifolia* or *venulosa*. The young branches are scarcely pubescent, and close. Leaves an inch and a half long, with short foot-stalks, ovals elliptic, sharp, denticulated not serrated, archedly recurved, compressly keeled; upper surface green, shining, most delicately veiny, underneath more pale, opake, scarcely glaucous, very smooth on both surfaces; when young furnished with a delicate silkiness scarcely discernible. TR.

Observations.

Doctor Smith (Eng. Bot. l. c.) observes, that it is allied to *S. prunifolia* and *venulosa*, but abundantly distinct. Mr. Dickson communicated it living from the Scottish mountains or rather Highlands. It flowers in April.

It is a large and more upright shrub than *S. prunifolia* and *venulosa*; the young branches are elongated and straight, nearly smooth. Stipules extremely minute, but shaped as in those species. Leaves elliptical, acute, minutely toothed rather than serrated, remarkably recurved and sharply keeled, so that the two sides approach each other, and the leaf cannot be pressed flat. Both surfaces are smooth and finely veined; the upper one green and shining, the under paler, opaque, slightly glaucous. In their very earliest state only the leaves glaucous. On the old branches a sort of tooth is observable, where each foot-stalk had previously stood. The catkins are small and ovate, with short roundish concave hairy scales. Germen twice as long as its corresponding scale, ovate, silky. Stigmas nearly sessile, ovate, thick and short, at length notched.

Female catkins slender, white, alternate, few, and sometimes terminating the branches. Leaves not all carinated. *Wade.*

LV.

SALIX CORUSCANS, Willdenow.—*Shining-leaved willow.*

Wild. Sp. Pl. 4. 681.—*S. arbuscula*, Jacq.
Austr. * t. 408.

Charact. Ess. Specif.

Foliis ovato-ellipticis acutis basi attenuatis
serratis glabris, supra nitidis, subtus glauces-
centibus, capsulis ovato-lanceolatis glabris.

Descriptio.

Rami fusci. *Folia* pollicaria et majora ova-
to-elliptica acuta, basi in petiolum attenuata,

* N. I. Jacquin, Flora Austriaca. Voll. 5. Viennæ,
1773, 1778. fol.

serrata, serraturis infimis glandulosis, supra nitida, subtus glauca, utrinque etiam juventute glaberrima. *Amenta* coetanea—mascula semipollicaria et parum majora cylindracea. *Squamæ* lanceolatae margine subciliatae. *Germina* ovato-lanceolata glabra. *Styli* elongati ad medium fere bipartiti. *Stigmata* obtusa emarginata. Valde affinis *Salicis tenuifoliae*. *Willd. l. c.*

Ess. Specif. Charact.

Leaves ovally elliptic, acute, thinned off at their base, serrated, smooth, shining above, glaucescent below, seed vessels ovally lance-shaped, and smooth. TR.

Description.

Branches brown. Leaves more than an inch long, ovally elliptic, acute, attenuated at their base into a petiolus or foot-stalk, serrated, the lower serratures furnished with glands, upper surface shining, glaucous below, and both very smooth, in their young as well as more grown state. Catkins appearing with the leaves—male a little more than an inch long, and cylindrical. Scales lance-shaped, and somewhat ciliated, on their margin. Seed-buds, ovally lance-shaped and

smooth. Style elongated, and almost cloven down to the middle.

Observations.

This species of willow bears a strong resemblance to *Salix tenuifolia*.

Willdenow, who examined this willow in a living state, informs us that it grows on the high mountains or Alps of Styria, Carinthia and Saltzburg.

LVI.

• *SALIX ARBUSCULA*, Willd.—*Little tree*
willow.

Willd. Sp. Plant. 4. 680. Fl. Danic. *
t. 1051. Fl. Lapp. 360. t. 3. f. M.

Character Essentialis Specificus.

Foliis lanceolatis, acutiusculis, serrulatis,
glabris, subtus glaucescentibus, amentis co-
aetaneis, capsulis ovato-lanceolatis glabris,
stylis geminis.

Description.

Rami luteo-fusci. *Folia* lanceolata polli-
caria breve petiolata acutiuscula basi atte-

• Icones Plantarum sponte nascentium in regnis Da-
niæ et Norvegiæ, editæ a Ge. Chr. Oeder, Oth. Frid.
Muller, et Mort. Vahel. Hafniæ, 1761. seqq. fol.

nuata, serrulata, glabra, supra læte viridia, subtus glaucescentia. *Stipulae* parvæ lanceolatae. *Amenta* foeminea pollicaria cylindracea. *Squamæ* ovato-lanceolatae ciliatae. *Germina* ovato lanceolata, glabra. *Styli* bini breves. *Stigmata* bifida.

Observatio.

Linneaus hanc cum *S. tenuifolia* et *foliolosa* conjunxerat, quæ ab hac diversissimæ. *Willd. l. c.*

Essential Specific Character.

Leaves lance-shaped, somewhat acute, finely sawed, smooth, under surface rather sea-greenish, catkins bursting forth with the leaves, seed-vessels ovally lance-shaped, smooth, styles double. TR.

Description.

Branches yellowish brown. Leaves lance-shaped, an inch long, with short foot-stalks, somewhat acute, thinned at their base, finely sawed, smooth, upper surface bright green, underneath sea-greenish. Stipules small and

lance-shaped. Female catkins cylindrical, an inch long. Scales ovally lance-shaped, smooth, and ciliated. Seed-vessels ovally lance-shaped, smooth, styles two and short. Stigmas bifid. Tr.

Observation.

Linnæus joined this species of willow with the *S. tenuifolia* and *foliolosa*, but it appears to be a very different plant.

Willdenow, who examined but the dry female plant, states that it grows in the sandy open fields in Lapland, and on the mountains of Switzerland.

LVII.

SALIX ARBUSCULA, Sm.—*Little tree willow.*

Fl. Lap. ed. Sm. 2. 297. t. 8. f. m. Fl.
Brit. Sm. 3. 1050. Eng. Bot. v. 19. t.
1366.

Character Essentialis Specificus.

Foliis lanceolatis obsoletè denticulatis glabris exstipulatis, ramulis pubescentibus.

Descriptio.

Caulis rectus, pedalis, gracilis. Rami erecto-patentes filiformes, juniores pubescentes. Folia alterna, petiolata, lanceolata, utrinque acuta, denticulata, denticulis minutis sparsis, venosa, venis rectiusculis, omnia tenuia et laxiuscula; juniora subtùs pilosa, pilis adpressis, sparsis. Petioli breviusculi, crassius-

culi, demùm glabri. Stipulæ nullæ. Amen-
ta . . . *Fl. Brit. Sm. l. c.*

Essential Specific Character.

Leaves lance-shaped, obsoletely set with small teeth, smooth, without stipules, and the branches pubescent. TR.

Description.

The trunk is erect, a foot high, and slender. Branches erectly spreading, filiform, the junior ones pubescent. Leaves alternate, foot-stalked, lance-shaped, on both edges acute, finely toothed, the teeth minute, and scattered, veiny, veins somewhat straight, all thin, and somewhat lax; the younger leaves hairy on their under surface, the hairs pressed down, and scattered. Leaf-stalks or petioli rather short, somewhat thick, in time becoming smooth. No stipules. Catkins
TR.

Observations.

Doctor Smith states, that this species of willow was gathered by Mr. Dickson in the highlands of Scotland, and that he carefully

compared it with Linnæus's Lapland specimen, the original species, though made a variety in *Sp. Fl.* and he finds no difference between them. It flowers in April.

The stem is erect, slender, about a foot high, naked below like a little tree, the branches spreading, and downy. Leaves on very short stalks, moderately spreading, lanceolate, but liable to vary greatly in breadth, flat, finely veined, at first sight apparently entire, but on an accurate inspection they will be found absolutely toothed, as Linnæus rightly asserted in *Fl. Lapp.* When young they are silky, but when full grown quite smooth above and nearly so below. Their colour is rather a light green. Of stipulæ no vestiges are to be found, except sometimes on extremely luxuriant radical shoots, where they are small lanceolate and flat. On such shoots the leaves become quite ovate and very broad. Catkins lateral, nearly sessile, erect, ovate, short. Scales oblong, notched, purplish, hairy. Germen silky, ovate-lanceolate, on a short stalk. Stigmas broad, ovate, tawny, with a very short style. Doctor Smith concludes with observing, that in natural affinity this comes near to *S. rosmarinifolia*, but on account of its smooth leaves Linnæus has placed them far asunder.

Fl. Dan. t. 1055. must be a different species from this plant.

LVIII.

SALIX HERBACEA, least willow.

Willd. Sp. Pl. 4. 682. Fl. Lapp. ed. 2. 294. t. 8. f. h. t. 7. f. 3. 4. Fl. Dan. t. 117. Hoffm. Sal. v. 1. 74. t. 20. Fl. Brit. v. 3. 1056. Eng. Bot. v. 27. t. 1907.

HORTUS GLASNEVINENSIS.

Character Essentialis Specificus. W.

Foliis orbiculatis, subretusis, serratis, utrinque nitidis, amentis fœmineis subquinquefloris, capsulis ovato-lanceolatis glabris.

Observatio.

Omnium minima caule lignosa, pollicari ramoso. *Willd. l. c.*

Essential Specific Character.

Leaves orbicular, retuse or ending in a broad shallow notch, sawed, shining on both surfaces, the female catkins containing about five flowers, seed-vessels oval lance-shaped, and smooth. TR.

Observation.

The very smallest of all the willows with a woody stem, an inch long, and branching.

Willdenow observes, that it grows on all the high mountains throughout Europe.

Character Essentialis Specificus. SM.

Foliis orbiculatis serratis glaberrimis reticulato-venosis utrinque nitidis, capsulis glabris.

Descriptio. SM.

Radix longè latèque repens, lignosa, ramosissima. Caules vix unciales, lignosi, sub-

ramosi, foliosi, glabri, fusci. Folia brevius petiolata, semiuncialia, orbiculata, obtusa, quandoque emarginata, undique serrata, rigidula, reticulato-venosa, utrinque læte viridia, nitida, glaberrima. Stipulæ nullæ. Amenta terminalia, solitaria, pedunculata, pauciflora, squamis obovatis, obtusis, subciliatis, extus glabratis. Stamina flava. Capsulæ ovato-lanceolatæ glabræ, rubicundæ. Stigmata bifida. *Fl. Brit. Sm. l. c.*

Essential Specific Character.

Leaves orbicular, serrated, very smooth, reticularly veiny, shining or polished on both surfaces, with smooth seed-vessels. TR.

Description.

Root creeping very much, woody, and branching exceedingly. Stems scarcely an inch long, woody, somewhat branching, leafy, smooth, and brown. Leaves with short foot-stalks, half an inch long, orbicular, obtuse, after some time notched, serrated all round, stiffish, reticularly veiny, both surfaces bright green, shining, and very smooth. Stipules none. Catkins terminal, solitary, pedunculated, with few flowers, scales inversely egg-

shaped, obtuse, somewhat ciliated, externally smoothened. Stamina yellow. Seed-vessels ovally lance-shaped, smooth, rubicund or very red. Stigmas bifid or cloven in two. TR.

Observations.

Doctor Smith states, that this is one of the least of all shrubs; for, being a willow, it is certainly a shrub, and the stems, short as they are, being scarcely an inch or two high, are truly woody and perennial. The woody roots are of greater extent, creeping and running deep into the rocky micaceous soil, which this species inhabits about the tops of the highest mountains of Scotland, Wales, and Cumberland. Doctor Smith gathered it on Ben Lomond. It blossoms in June, and the capsules ripen in August.

Leaves on short foot-stalks, as correctly orbicular as in almost any plant, serrated all round; sometimes emarginate, very smooth, shining, reticulated, rather rigid, deciduous. Doctor Smith could find no stipulas. Catkins terminal, solitary, on short stalks, lemon coloured, ovate, internally hairy in the male only, as far as Doctor Smith could perceive. Nectary of two ovate glands. Stamens dis-

tinged. Germen nearly sessile, ovate taper, smooth, reddish as it ripens. Style very short. Stigmas small, deeply cloven.

LIX.

SALIX ARBUTIFOLIA, *Arbutus-leaved*
willow.

Willd. Sp. Plant. 4. 682.

Charact. Ess. Specif.

Foliis lanceolatis serrulatis acutis utrinque glabris nitidis, subtus reticulato-venosis, amentis coactaneis, germinibus lanceolatis pilosis.

Descriptio.

Sub nomine *S. arbutifoliae Afzelii* mecum communicavit C. Flugge. *Rami nigro-fusci. Folia* breve petiolata quadrilinearia lanceolata

utrinque glabra nitida acuta tenuissime serrulata. Amenta fœminea fere pollicaria cylindracea. Squamæ oblongæ obtusæ fuscæ pilosæ. Germina lanceolata hirta. Styli elongati. Stigmata quatuor crassiuscula. Willden. l. c.

Observatio.

S. arbutifolia Pall. Ros. 2. p. 79. ab hæc est diversissima, sed hanc ob mancā descriptionem haud indicavi. Omnes fere salices Pallasii sunt dubiæ. Willd. l. c.

Ess. Specif. Charac.

Leaves lance-shaped, finely sawed, acute, smooth on both surfaces, shining, underneath reticularly veiny; catkins bursting forth with the leaves, seed-buds lance-shaped and hairy. TR.

Description.

The celebrated Flugge communicated this willow to Professor Willdenow, under the name of *S. arbutifolia* of Afzelius.

Branches blackish brown. Leaves with short foot-stalks, four lines long, lance-shaped, smooth on both surfaces, shining, acute, most delicately and finely sawed. Female catkins, almost an inch long, and cylindrical. Scales oblong, obtuse, brown, and hairy. Styles elongated. Stigmas four and somewhat thick. TR.

Observations.

The *S. arbutifolia* of Pallas is totally different from this, but which, on account of the imperfect description, Willdenow has not pointed out; and he further observes, that almost all the species of *Salix* of Pallas are uncertain, and by no means settled.—He states that this *Salix* grows on mount Pilato or Pilatus in Switzerland, and on the high mountains of Savoy. TR.

LX.

SALIX BERBERIFOLIA, *berberry-leaved*
willow.

Willd. Sp. Pl. 4. 683. Fl. Ross. 2. p.
84. t. 82. Gmel. Sibir. 1. p. 161. t. 35.
f. 3.

Char. Ess. Specif.

Foliis obovato-lanceolatis obtusiusculis ser-
ratis utrinque nitidis glabris subtus reticulato-
venosis, capsulis ovatis, glabris. *Willd. l. c.*

Observatio.

Frutex in calvis rupibus diffusus. *Folia*
quadrilinearia rigida. Willd. l. c.

Ess. Spec. Charac.

Leaves inversely egg-lance-shaped, some-
what obtuse, serrated, shining on both sur-
faces, underneath reticularly veiny; seed-
vessels oval and smooth. TR.

Observations.

A shrub extending very much on the bare rocks, with stiff leaves of four lines long. Growing on the very high mountains of Davuria.

It appears to be a very small shrub, extending over mossy rocks, about the size of the *Arbutus alpina*, with a stem hardly the size of the little finger, the bark yellowish and full of joints; the branches are much crowded and twisted or matted together. In Kamtschatka, the twigs are a foot and a half long and more slenderly stretched out. Leaves on the outmost branches, much clustered together, small, reticulated with rather thick veins, and rigid. The denticulations on the edges are distant, spreading somewhat, acuminate and unequal. The male amenta or catkins appear among the old leaves from the terminal buds, the length of the leaf; thin, with distant plushy scales, and two or three stamens. Female catkins shorter than the leaf, with a few, rather big, clustered capsules. On the male shrub, the branches are more slender and lengthened out; the leaves are smaller with more frequent imbricated serratures.

* * { *Foliis glabris integerrimis* } Willd.
 { *glabriusculis* } Smith.

{ Leaves smooth, very entire. *W.*
 { *somewhat smooth* *S.*

LXI.

SALIX KITAIBELIANA, Willd.—*Kitaibel's*
willow.

Sp. Pl. Willd. v. 4. 683.

Charact. Ess. Specif.

Foliis ovato-lanceolatis integerrimis emar-
 ginatis, glabris, supra nitidis, amentis coae-
 taneis cylindraceis multifloris, squamis ger-
 mina ovato-lanceolata brevioribus. *Willd.*
l. c.

Descriptio. SM.

Rami atro-fusci, juniores nitidi. *Folia* fere pollicaria ovato-lanceolata integerrima apice emarginata, utrinque glaberrima, supra nitida, subtus parallelo-venosa minus nitida. *Amenta* foeminea terminalia, pollicaria, cylindracea, erecta, multiflora. *Squamæ* oblongæ retusæ glabræ, apice pilis aliquot instructæ, germine triplo minores. *Germina* pedicellata, ovato-lanceolata glabra. *Stylus* mediocris bifidus. *Stigmata* bifida. *Capsulae* ovatae longe pedicellatae. *Willd. l. c.*

Observatio.

Accedit valde ad *S. retusam*, sed abunde distincta; foliis multoties majoribus semper emarginatis, *amentis* foemineis cylindricis multifloris, squamis germina triplo brevioribus, *capsulisque* longe pedicellatis.

Varietates plures in alpibus *S. retusæ* foliis majoribus legi, sed nullam *amentis* multifloris cylindricis observavi. *Willd. l. c.*

Ess. Specif. Charact.

Leaves ovally lance-shaped, very entire, notched, smooth, upper surface shining; catkins appearing with the leaves, cylindrical, many-flowered, scales much shorter than the ovally lance-shaped seed-buds. TR.

Description.

Branches blackish brown, the young ones shining. Leaves almost an inch long, ovally lance-shaped, very entire, emarginated at their extremities, very smooth on both surfaces, upper ones shining, underneath parallelly veiny and less shining. Female catkins terminal, an inch long, cylindrical, erect, and furnished with many flowers. Scales oblong, retuse, or ending in a broad shallow notch, smooth, with a few hairs on their extremities, shorter by a third than the seed-buds. Seed-buds foot-stalked, ovally lance-shaped, and smooth. Style of a middling size and bifid. Stigmas bifid. Seed-vessels ovate, with long foot-stalks. TR.

Observations.

This *Salix* resembles *S. retusa*, the next to be considered, very much; however, it is to

be considered as a completely distinct species—the leaves are frequently larger, always emarginated or notched; the female catkins cylindrical and furnished with many flowers; the scales three times shorter than the seed-buds, and the seed-vessels furnished with long foot-stalks.

Many varieties of *S. retusa* with larger leaves have been found on the Alps or very high mountains, but Willdenow could not observe any with many-flowered cylindrical catkins.

He examined this willow in a dry state, and informs us, that it is to be found on the Alps or very high mountains of Carpathia.

Tr.

LXII.

SALIX RETUSA, blunt-leaved willow.

Wild. Sp. Pl. 4. 684.

Charact. Ess. Specif.

Foliis obovatis integerrimis acutis emarginatisve, glabris, supra nitidis, amentis foemineis oblongis, paucifloris, squamis longitudine germinis oblongi. *Willd. l. c.*

Observatio.

Parvitate certat cum *S. herbacea*. *Folia*
venis parallelis. *Willd. l. c.*

Ess. Specif. Charact.

Leaves inversely egg-shaped, very entire, acute or without a broad edge, smooth, upper

surface shining, female catkins oblong, and with few flowers; scales the length of the oblong germen or seed-bud. TR.

Obervation.

It vies as to diminutive growth with *S. herbacea*. The leaves are covered all over with parallel veins.

Willdenow, who examined it in a living state, asserts that it grows on the very high mountains of Switzerland, France, Italy, Tyrol, Carniola, and Styria. TR.

LXIII.

SALIX SERPILLIFOLIA, *thyme-leaved*
willow.

Wild. Sp. Pl. 4. 684. Scopol. * Carn.
n. 1207. t. 61.

Charact. Ess. Specif.

Foliis ovatis, ovato-lanceolatisve, integer-
rimis acutis, glabris, supra nitidis; amentis
oblongis paucifloris; capsulis ellipticis, glabris;
stigmatibus sessilibus, *Willd. l. c.*

Observatio.

A fere omnibus Botanicis, puta Hallero,
Allionio, Villarsio, &c. pro varietate præce-
dentis habetur; sed constanter diversa manet,

* I. A. Scopoli Flora Carniolica. Tomi 2. Viennæ,
1772. 8vo.

sequentibus characteribus. *Foliis* triplo fere minoribus, semper acutis. *Squamis* amenti foeminei durante anthesi germine longioribus, post anthesin triplo brevioribus. *Stylo* nullo quum in præcedente stylus mediocris adest; denique *germinibus* oblongo-ellipticis, apice non angustatis *Willd. l. c.*

Ess. Specif. Charact.

Leaves ovate, or ovally lance-shaped, very entire, acute, smooth, upper surface shining, catkins oblong, with few flowers; seed-vessels elliptic, smooth, and stigmas sessile.
Tr.

Observations.

Almost all botanists, as Haller, Allioni, Villars, and others took this willow for a variety of the former (*S. retusa*)—but it appears to be totally and constantly different, as the following characters will best evince—the leaves are almost, three times as small, always acute—the scales of the female catkin, during flowering time, are longer than the seed-bud, but afterwards three times as short—no style, when in the former there appears to be one of a midling size, and lastly the seed-buds are oblong elliptic, and not narrowed at their extremities.

Willdenow examined this willow in a dry state. Found on the very high mountains of France, Italy, Switzerland and Carniola. TR.

X LXIV.

SALIX FOLIOLOSA, *leafy-willow*.

Sp. Pl. Willd. 4. 685. Fl. Lapp. ed. Sm. 295.

Charact. Essent. Specif.

Foliis ovatis integerrimis glabris subtus glaucis, germinibus villosis. Willd. l. c.

Ess. Specif. Charact.

Leaves ovate, very entire, smooth, under surface glaucous, seed-buds villous. TR.

Descriptio.

Formam et faciem gerit exacte eandem, quam *S. tenuifol.* vix pedalis, sed folia

integerrima sunt, superne viridia glabra, inferne glauca seu cærulescentia, tenuissima et fere pellucida, confertim nata, ovato-oblonga.

Flores infra folia, flavescentes, germinibus villosis albis. *Fl. Lapp. l. c.*

Description.

It has the form and appearance exactly of *S. tenuifolia*, scarcely a foot high, but the leaves are very entire, upper surface green and smooth, underneath glaucous or bluish, very thin, almost pellucid, growing close together, and of an ovate oblong form.

The flowers below the leaves are yellowish, with white villous seed-buds. It grows in the sandy open fields of Lapland, and is of rare occurrence. *Fl. Lap. l. c. Tr.*

LXV.

SALIX MUCRONATA, sharp-pointed willow.

Willd. Sp. Pl. 4. 685. Thunberg, Prod. 6.

Charact. Ess. Specif.

Foliis integerrimis glabris oblongis mucronatis, subtus glaucis. *Thunberg. l. c.*

Essent. Specif. Charact.

Leaves very entire, smooth, oblong, mucronated or tipped with a rigid spine, sea-green colour underneath. *Tr.*

A native of the Cape of Good Hope.

LXVI.

SALIX RETICULATA, wrinkled willow.

Willd. Sp. Plant. 4. 685. Fl. Lapp. ed. Sm. 296. t. 8. f. L. t. 7. f. 1, 2. Fl. Danic. t. 212. Hoff. Sal. v. 2, 3. t. 25, 26, 27. Fl. Brit. Sm. 3. 1057. Eng. Bot. v. 27. t. 1908.

HORTUS GLASNEVINENSIS.

Charact. Essent. Specif. W.

Foliis elliptico-orbiculatis obtusissimis integerrimis glabriusculis, subtus glaucis, reticulato-venosis, amentis serotinis longe pedunculatis, germinibus oblongis villosis. *Willd. l. c.*

Description. w.

Gemmæ promunt *folia* 3 ovata, obtusa, petiolata, integerrima, obsolete pilosa, supra vi-

ridia, rugosa, subtus glauca, reticulata; venis primum rubris, demum viridibus. *Spica* ex eadem gemma. *Willd. l. c.*

Observatio.

Variat foliis semipollicaribus, utrinque glabris, vel venis villosis; vidi etiam varietates foliis subtus et utrinque villosis. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptically orbicular, very obtuse and very entire, somewhat smooth, sea-green underneath, reticularly veiny, catkins appearing late with very long peduncles or foot-stalks, seed-buds oblong and villous. *TR.*

Description.

The buds throw out three leaves, which are ovate, obtuse, foot-stalked, very entire, obsoletely hairy, upper surface green and rough, underneath glaucous and reticulated; the veins at first are red, at length becoming green. The spike of flowers proceeds from the same bud with the leaves. *TR.*

Observation.

This willow varies with leaves half an inch long, both surfaces smooth or covered with villous veins—varieties have likewise been seen with their leaves underneath villous or shaggy, and likewise villous on both surfaces.

Willdenow states, that this willow is to be met with on the tops of very high mountains all over Europe. TR.

Charact. Ess. Specif. SM.

Foliis elliptico-orbiculatis obtusis integerrimis glabris reticulato-venosis subtus glaucis, capsulis villosis. *Fl. Brit. l. c.*

Descriptio. SM.

Radix lignosa. Caules ramosissimi, lignosi, validi, diffusi, cinerei, glabri, ramulis rubicundis, foliosis. Folia longius petiolata, patentia, elliptico subrotunda, vel obovata, obtusa, integerrima, subrevoluta, rigida, reticulato-venosa, glabra; suprâ viridia; subtus albido-glauca,

venis rubris; juniora pilosa. Petioli graciles, rubri. Stipulæ nullæ. Amenta terminalia, solitaria, longiùs pedunculata, brevia, subclavata, densa, squamis parvis, obovatis, obtusis, subpubescentibus. Stamina rubra. Capsulæ ovatæ, villosæ. Stigmata subsessilia, bipartita. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves elliptically orbicular, obtuse, very entire, smooth, reticularly veiny, glaucous underneath; seed-vessels shaggy or villous.
Tr.

Description.

Root woody. Stems very branching, woody, strong, diffuse, ash-coloured, smooth; young branches very red, leafy. Leaves with long foot-stalks, spreading, elliptically half round or inversely egg-shaped, obtuse, very entire, some revolute or their margins rolled backwards, stiff, reticularly veiny, smooth; upper surface green; underneath a whitish sea-green colour, with red veins; the very young leaves are hairy. Leaf-stalks slender and red. Stipules none. Catkins terminal, solitary, with very long peduncles or flower-stalks,

short, half-club-shaped, compact, scales small, inversely egg-shaped, obtuse, somewhat pubescent. Stamens red. Seed-vessels ovate and villous. Stigmas sessile, and cloven in two. TR.

Observations.

This willow was sent to Doctor Smith from the Scottish mountains of Ben Lawers by the late Mr. A. Bruce, but in a dried state, so that he and Mr. Sowerby had recourse to the Hon. C. Greville's garden in order to be correct in the colours, and to an exotic specimen for the male catkin, as so beautifully and correctly represented in English Botany.

Doctor Smith observes very justly, that it is one of the most elegant of our Alpine plants, and that it is found also in Wales and Yorkshire, blossoming in June or July.

The roots are thick and woody, and the branching stems cling close to their native rocks, forming a carpet or tapestry over them. Leaves on long foot-stalks, without stipulas, an inch broad, orbicular or elliptical, smooth, rigid and coriaceous, entire, though the

projection of the spaces between the beautiful net-work of the veins sometimes gives an appearance of notches; they are dark green and shining above, glaucous and opaque beneath. When young they are finely downy. Catkins on longish, terminal, red, downy stalks, cylindrical, many flowered, reddish. Scales obovate, woolly. Nectary, in the female at least, of four awl-shaped glands. Germen and capsule ovate, sessile, cottony. Stigmas deeply divided, with hardly any style.

LXVII.

SALIX MYRTILLOIDES, *bilberry-leaved*
willow.

Willd. Sp. Pl. 4. 686. Fl. Lapp. ed. Sm.
p. 295. t. 8. f. i. k. Villars* Delphin. t.
50. *S. cæsia*.

HORTUS GLASNEVINENSIS ?

Charact. Ess. Specif.

Foliis ellipticis integerrimis acutis mucro-
natis glabris subtus glaucis, capsulis ovatis vil-
losis. *Willd. l. c.*

Description.

Rami nigro-fusci. *Folia* fere pollicaria,
elliptica, acuta, mucronata, integerrima, utrin-

* Histoire des Plantes de Dauphiné par M. Villars.
Tomes 3. Grenoble, 1786—1789. 8vo.

que glabra, subtus glaucescentia. *Amenta* foeminea unguicularia. *Germina* ovata villosa. *Stylus* brevis. *Stigmata* duo obtusa subretusa. *Willd. l. c.*

Ess. Specif. Character.

Leaves elliptic, very entire, acute, tipped with a rigid spine, smooth, underneath glaucous; seed-vessels ovate and villous. TR.

Description.

Branches blackish brown. Leaves almost an inch long, elliptic, acute, tipped with a rigid spine, very entire, smooth on both surfaces, underneath sea-greenish. Female catkins a nail's breadth or a little larger. Scales oblong, obtuse, smooth, somewhat emarginate or nicked. Seed-buds ovate and villous. Style short. Stigmas two obtuse, and somewhat retuse or ending in a broad shallow notch. TR.

Observation.

Willdenow, who examined the female of this willow only in a dry state, informs us that it grows in alpine situations, in Lapland, and Dauphiny. TR.

LXVIII.

SALIX INTEGRA, *entire-leaved Japan willow*.

Willd. Sp. Pl. 4. 686. Fl. Japon. Thunberg. 24.

Char. Ess. Specif.

Foliis integris glabris lineari-oblongis obtusis.

Descriptio.

Caules teretes, longi, cinerei glabri. *Folia* e gemmis plura, sessilia, lineari-oblonga, obtusa, integra, utrinque glabra, patentia, semipollicaria et ultra. *Flores* e gemmis cumfoliis. *Thunberg. l. c.*

Ess. Specif. Character.

Leaves entire, smooth, linear-oblong, obtuse. TR.

Description.

Stems round, long, ash-coloured and smooth, leaves many from the buds, sessile, linear-oblong, obtuse, entire, smooth on both surfaces, spreading, a little more than half an inch long. Catkins burst forth together with the leaves from the buds. TR.

Native of Japan.

*** { *Foliis villosis* } Willd.
 Leaves-villous. } and Smith.

LXIX.

SALIX Ægyptiaca, Egyptian willow.

Willd. Sp. Pl. 4. 687. Fl. Ros. Pall. 2.
 p. 77. *S. serotina*.—EjUSD. Itin. 3. app. n.
 135. t. N. n.—Gmelin. Itin, 3. p. 283. t.
 28.

Charact. Ess. Specif.

Foliis oblongis lanceolatis obtusis integer-
 rimis supra nitidis glabris, subtus sericeo-
 pubescentibus, capsulis ovatis tomentosis.
Willd. l. c.

Ess. Specif. Charact.

Leaves oblong, lance-shaped, obtuse, very entire, upper surface shining and smooth, underneath silkily pubescent; seed-vessels ovate and downy. TR.

A native of Egypt, Syria, Persia, and about Astracan.

LXX.

SALIX GLAUCA, Willd.—*Glaucous willow.*

Willd. Sp. Pl. 4. 687.—Fl. Lapp. ed. Sm. 299. t. 7. f. 5. t. 8. f. p.

Charact. Ess. Specif. w.

Foliis oblongo-lanceolatis acutiusculis integerrimis supra viridibus pubescentibus subtus villosis albis, amentis ellipticis villosis.
Willd. l. c.

Descriptio. w.

Rami fusci. *Ramuli* villosi. *Folia* pollicaria oblongo-lanceolata basi attenuata apice obtusiuscula, integerrima, supra viridia pilis sparsis obsita, costa media albo-villosa, subtus alba villis longis oblecta, minime sericea. *Stipulas* nullas inveni. *Amenta* mascula tantum vidi, quæ elliptica villosa. *Antheræ* testaceæ. *Willd. l. c.*

Ess. Speif. Charact.

Leaves oblong lance-shaped, somewhat sharp, very entire, upper surface green and pubescent, underneath shaggy and white; catkins elliptic and villous. TR.

Description.

Branches brown. Small branches villous. Leaves an inch long, oblong lance-shaped, attenuated or thinned at their base, somewhat obtuse at their apex, very entire, upper surface green and covered with scattered hairs, the middle rib with a villous whiteness, underneath white, and covered with long wool

a little silky. No stipules have been found. Male catkins have been only seen, which were elliptic and villous. Antheræ or anthers testaceous or shelly. TR.

Willdenow, who examined the male plant only in a dry state, informs us that it is found on alpine situations in Lapland.

SALIX GLAUCA, SM. *Glaucous mountain willow.*

Hall. Enum. ed. I. n. 21. t. 14? Hist. v. 2. 307. n. 1642. — Eng. Bot. v. 26. 1810.

Doctor Smith, whose essential specific character of this willow runs thus,

“Leaves nearly entire, elliptic lanceolate; even and nearly smooth; footstalks decurrent,” states, that Mr. Crowe received this willow from the Highlands of Scotland by favour of Mr. Dickson, and that he found in Mr. Davall’s herbarium abundant Swiss specimens, which prove it to be the plant figured in Haller, and the herbarium of Linnæus shows it to be his *glauca*. Mr. Davall’s collection likewise shews, that Haller’s n. 1643 is the

sericea of Villars, and the *Lapponum* of Linnaeus, a species not yet ascertained as a native of Britain.

Doctor Smith observes, that *S. glauca* is new to the British flora, and not well known to botanists in general. It has passed for a variety of *S. arenaria*, but Mr. Crowe was aware of the difference, though Doctor Smith only since his death has settled the above specific character, and the synonyms referred to in Eng. Bot. l. c. It is about the size of *S. arenaria*, but the elliptical, narrower, smooth, and even leaves, peculiarly white, (when young beautifully satiny) with less prominent veins beneath, and the more decurrent foot-stalks, evidently distinguish it; to which may be added that the stigmas are shorter and thicker, and that convex rounded stipulas have occasionally been noticed, not observed in the other. It blossoms in May, rather after *S. arenaria*.

LXXI.

SALIX SERICEA, *silky-leaved willow*.

Willd. Sp. Plant. 4. 688. Villars. Delphin.
3. p. 782. t. 51. f. 72.

Charact. Ess. Specif.

Foliis oblongo-lanceolatis integerrimis obtusis utrinque sericeis; capsulis ovato-oblongis villosis sessilibus, *Willd. l. c.*

Descriptio.

Rami fusci nitidi. *Folia* bipollicaria oblongo-lanceolata, obtusa, integerrima, utrinque sericeo-albida, pilis longis adpressis tecta. *Stipulae* nullae. *Amenta* semipollicaria cylindracea. *Squamæ* lanceolatae pilosae caducae. *Germina* ovato-oblonga, valde villosa alba. *Stylus* brevis bifidus. *Stigmata* dilatata bifida. *Willd. l. c.*

Observatio.

Hanc cum *S. glauca* conjunxit Clariss. Smith, a qua vero diversissima. *W.*

Ess. Specif. Charact.

Leaves oblong lance-shaped very entire obtuse silky on both surfaces, seed-vessels ovate-oblong villous and sessile. *Tr.*

Description.

Branches brown and shining. Leaves two inches long, oblong lance-shaped, obtuse, very entire, a silky whiteness on both surfaces, and covered with long close pressed hairs. No stipules. Catkins half an inch long and cylindrical. Scales lanceolate, hairy, caducous or separating from the flower very soon. Seed-buds ovate-oblong, copiously covered with a white down. Style short and bifid. Stigmas spread out and bifid. *Tr.*

Observation.

Willdenow observes, that the celebrated Doctor Smith has joined this species of willow with the last (*S. glauca*,) but from which nothing can be more different. He has not perhaps seen Eng. Bot. v. 26, 1810? where Doctor Smith expressly says, *not the sericea of Villars.*

This willow is found on Alpine situations in Switzerland and France. TR.

LXXII.

SALIX CANESCENS, *hoary willow.*

Willd. Sp. Pl. 4. 687.

Charact. Ess. Specif.

Foliis oblongo-lanceolatis acutis medio subserratis, supra glabris nitidis, subtus albo-

tomentosis, capsulis ovatis tomentosis. *Willd.*
l. c.

Descriptio.

Rami fusci, juniores subpubescentes. *Folia* bi-seu tripollicaria oblongo-lanceolata, acuta, videntur integerrima, sed attente adspecta medio serraturis parvis instructa, supra nitida glabra, subtus tomento tenui albo obducta, juniora etiam supra canescentia. *Stipulae* nullae. *Amentum* foemineum pollicare cylindraceum. *Capsulae* ovatae sessiles tomentosae. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong lance-shaped, acute, somewhat serrated in the middle, upper surface smooth and shining, underneath covered with a white down, seed-vessels ovate and downy.
 TR.

Description.

Branches brown, the young ones subpubescent. Leaves two or three inches long, oblong lance-shaped, acute, and they ap-

pear to be very entire, but a closer inspection discovers that they are furnished with small serratures in the middle, upper surface shining and smooth, underneath covered with a delicate white down; the young leaves likewise are canescent or hoary. No stipules. Female catkin an inch long and cylindrical. Seed-vessels ovate, sessile and downy. TR.

Willdenow, who examined the male of this willow in a dry state, could not ascertain its native place of growth.

LXXIII.

SALIX SALVIFOLIA, *Portugal sage-leaved*

willow.

Willd. Sp. Pl. v. 4. 688. Link. in Litt.—*
Brotero Fl. Lusitanic, v. 1. p. 29?

Charact. Ess. Specif.

Foliis oblongo-lanceolatis acutis medio obsolete remote dentatis, supra canis, subtus tomentosis rugoso-venosis, stipulis semicordatis acutis integerrimis. *Willd. l. c.*

Description.

Rami fusco-nigricantes, juniores pubescentes. *Folia* oblongo-lanceolata basi attenuata

* Professor Link of Rostock known in England by his works relative to natural history, as well as Travels in Portugal, together with Count Hoffmansegg of Brunswic, has published a *Flora Lusitanica* which, bids fair to rank amongst the first rate productions of the kind, "*Flore Portugaise par I. C. Comte de Hoffmansegg et H. F. Link. Berlin, 1809, fol.*

apice acuta bipollicaria, a medio ad apicem dentibus admodum parvis, remotissimis, supra canescentia, subtus albo-tomentosa rugoso-venosa. *Stipulae* majusculæ semicordatæ integerrimæ acutæ. *Amenta* nulla vidi. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong lance-shaped, acute, obsoletely and remotely dentated in the middle, upper surface hoary, underneath woolly and roughly veiny, stipules half-heart-shaped, acute, and very entire. TR.

Description.

Branches brownish black, young ones pubescent. Leaves oblong lance-shaped, attenuated or thinned at their base, sharp at their extremities, two inches long, from the middle to their extremities furnished with very small and very remote teeth, upper surface canescent or downy, underneath whitishly woolly and roughly veiny. Stipules somewhat large and half-heart-shaped, very entire and sharp. Catkins have not been seen. TR.

This willow is a native of Portugal.

LXXIV.

SALIX LANATA, *woolly willow*.

Willd. Sp. Plant. v. 4. 688. Fl. Lapp. 368. t. 8. f. X. et t. 7. f. 7. Pallas. It. 3. p. 449. Fl. Lapp. 361. t. 8. f. N. S. *depressa*.

Charact. Ess. Specif.

Foliis subrotundo-ovatis integerrimis acutis utrinque dense lanatis albis, amentis cylindraceis, capsulis glabris. *Willd. l. c.*

Observatio.

Folia conferta, ovata, utrinque lanata, integerrima, subsessilia.

Varietatem *depressam* eandem esse cultura docuit.

Varietas *depressa* est species distincta, at dubia secundum Clariss. Smith, quæ *cotini-foliæ* accedit. Willd. l. c.

Ess. Specif. Charact.

Leaves somewhat rounded or roundish and ovate, very entire, acute, densely covered on both surfaces with a white woollyness, catkins cylindrical, seed-vessels smooth. TR.

Observations.

Leaves thick and close together, ovate, woolly on both surfaces, very entire, not quite destitute of a foot-stalk.

It has been said, that this willow and the variety *depressa* are the very same under cultivation.

The variety *depressa* however is a distinct species, though doubted by the celebrated Smith, and which comes near to his *cotinifolia*. TR.

Found on the very high mountains of Lapland.

LXXV.

SALIX LAPPONUM, *Lapland willow.*

Willd. Sp. Pl. v. 4. 689. Fl. Lapp. 366.
t. 8. f. T.

Charact. Ess. Specif.

Foliis lanceolatis integerrimis obtusiusculis, supra canis, subtus tomentosis, subinæquilateralis amentis cylindraceis, capsulis tomentosis oblongis. *Willd. l. c.*

Description.

Rami fusci, sæpius pallidi glabri. *Folia* lanceolata pollicaria vel sesquipollicaria, obtusa, vel acutiuscula, integerrima, supra cana, subtus albo-tomentosa. *Stipulae* nullæ. *Spicae* pollicares cylindraceæ. *Squamæ* lanceolatae villosæ. *Capsulae* oblongæ tomentosæ. *Stylus* mediocris. *Stigmata* bilamellata. *Costa media* foliorum sæpius folium inæqualiter percurrit. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, very entire, somewhat obtuse, upper surface hoary, underneath woolly, obscurely unequilateral, catkins cylindrical, seed-vessels woolly and oblong. TR.

Description.

Branches brown, more frequently pale and smooth, leaves lance-shaped, an inch or an inch and a half long, obtuse or somewhat acute, very entire, upper surface hoary, underneath whitely woolly. No stipules. Spikes and flowers an inch long and cylindrical. Scales lance-shaped and villous. Seed-vessels oblong and woolly. Style of a middling size. Stigmas bilamellated or covered with a double row of films. The middle rib of the leaves is frequently run over with a leaf unequally distributed. TR.

Observations.

Found every where on Alpine situations in Lapland.

It is said that this species of willow, and the *Betula nana*, support the perpetual fires of the Laplanders.

LXXVI.

SALIX ARENARIA, downy mountain willow.

Willd. Sp. Pl. 4. 689. Fl. Lapp. ed. Sm. 298. t. 8. f. o. q. Villars. Delp. 3. 783. S. *Helvetica*. Gmel. Sibir. v. 1. 164. t. 36. f. 1. Fl. Brit. Sm. v. 3. 1058. Eng. Bot. v. 26. t. 1809.

HORTUS GLASNEVINENSIS. VI.

Charact. Ess. Specif. W.

Foliis oblongis subintegerrimis supra glabriusculis subtus albo-tomentosis acutis, amentis masculis oblongis, foemineis cylindraceis, germinibus ovatis, tomentosis, stylis elongatis.
Willd. l. c.

Descriptio. W.

Rami fusco-rubicundi, glabri, juniores pubescentes. *Folia* oblonga, vel ovato-oblonga interdum lanceolata, pollicaria vel fere bipollicaria integerrima, quandoque obsoletè serrata, superne ab initio canescentia, denique glabra saturate viridia, subtus albo-tomentosa lanata. *Amenta mascula* oblonga obtusa; *fæminea* pollicaria cylindræa. *Squamæ* ovato-lanceolatæ pilosæ. *Germina* ovata tomentoso-lanata. *Stylus* elongatus. *Stigmata* bina dilatata. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong, somewhat entire, upper surface smoothish, underneath whitely downy, acute, the male catkins oblong, females cylindrical; seed-buds ovate, woolly, with the styles elongated. TR.

Description.

Branches a brown deep red, smooth, the young ones pubescent. Leaves oblong, now

and then lance-shaped, an inch or almost two inches long, very entire, after some time obscurely sawed, upper surface from the beginning canescent or hoary, at length becoming smooth and of a deep green, underneath whitely downy and woolly. Male catkins oblong and obtuse; females an inch long and cylindrical. Scales ovally lance-shaped and hairy. Seed-buds ovate, and covered with a downy wool. Style elongated. Stigmas double and dilated or breadthened out. TR.

Willdenow, who examined this species of willow in a dry state, informs us that it is to be found on Alpine situations in Lapland, Scotland, Switzerland, Dauphiny, Tyrol, and Styria.

Charact. Ess. Specif. SM.

Foliis subintegerrimis ovatis acutis: supra subvillosis; subtùs densissimè lanatis. *Fl. Brit. l. c.*

Descriptio. SM.

Caulis 4-5 pedalis, ramosus. Rami crassiusculi rubicundi, sublanati. Folia petiolata,

erectiuscula, subsesquiuncialia, ovata, acuta, parum revoluta, plerumque integerrima, subindè obsoletè serrata; suprà atro-viridia, tomento raro laxo tecta, et demum glabrata; subtus densè lanata, nivea, venis prominentibus, in plantâ masculinâ angustiora, magisque subtus sericea, ad S. Lapponum veram aliquantulum accedentia. Stipulæ, ut videtur, omninò nullæ. Amenta brevia, villosissima, obtusa. Stamina lutea. Capsulæ lanatæ. *Fl. Brit. Sm. l. c.*

Observatio. SM.

Gmelinus, ut videtur, Linnæum in errorem duxit de synonymo Dillenii apud Raii Syn. quod ad S. argenteam spectat. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charac.

Leaves somewhat entire ovate, acute, upper surface subvillous; underneath most densely woolly. TR.

Description.

Stems or trunks 4 or 5 feet high and branching. Branches thickish, rubicund or reddish, somewhat downy. Leaves foot-stalked,

rather erect, about an inch and a half long, ovate, sharp, a little revolute or their margins turned backwards, for the most part very entire, now and then obscurely serrated; upper surfaces blackish green, covered with a thin loose wool, and at length becomes smoothened; underneath densely woolly, snowy, and furnished with prominent veins; in the male plant the leaves are narrower, and more silky underneath, appearing somewhat like the true *S. Lapponum*. There appear to be altogether no stipules. The catkins are short, very shaggy and obtuse. Stamens yellow. Seed-vessels woolly. TR.

Observations.

Discovered on the mountains of Breadalbane by the Rev. Mr. Stuart, who communicated it to Mr. Lightfoot. The latter taking it for the *Lapponum* of Linnæus, compiled a description from *Fl. Lapp.* which does not apply to the present plant. The original cause of this confusion was Gmelin, who assured Linnæus that the figure of Dillenius in Ray's *Synopsis* t. 19. f. 3, was the Linnæan *S. arenaria*; how erroneously, may be seen by turning to *S. argentea* (which is to be considered by and by) t. 1364 v. 26. Eng. Bot. which is Dillenius's plant. Villars

mistakes the *arenaria* for Haller's t. 14, which is *S. glauca*, before considered.

Doctor Smith (Eng. Bot. 1. c.) observes the *arenaria* is a stout-branched, bushy shrub, 2 or 3 feet high, flowering in May, with reddish brown, slightly downy twigs. The down is cottony and depressed. Leaves but little spreading, ovate, acute, entire or slightly waved, somewhat revolute; dark green, reticulated with sunk veins, and clothed with thin cottony down above; very white and woolly, with prominent veins beneath. Stipules none. Foot-stalks broad at the base, not decurrent. Flowering buds very large, gibbous. Catkins ovate, soon becoming cylindrical, hairy. Stamens smooth. Capsules (from exotic specimens) woolly, nearly sessile. Style long, slender, with slender deeply cloven stigmas.—Doctor Stuart's male plant with narrower leaves, before described, is a remarkable variety, if not a distinct species, approaching to the true *S. Lapponum*.

Female catkins, oblong, snow-white, squamæ, or calyx scales, acute, exceedingly hairy, and blackish brown. Germens or seed-buds small, inflated and covered all over with a close silky white wool. Style bifid and marcescent or withery. Nectarium very slender.
Wade.

LXXVII.

SALIX APPENDICULATA, *Finmark willow*.

Sp. Pl. Willd. 4. 690. Fl. Danic. t. 1056.

Foliis ovato-oblongis integerrimis villosis, subtus subtomentosis, stipulis lanceolatis persistentibus oblongis, germinibus oblongo-lanceolatis tomentosis, stigmatibus sessilibus.
Willd. l. c.

Leaves ovate, very entire, villous, underneath somewhat downy, stipules lance-shaped, persistent and oblong; seed-buds oblong lance-shaped, downy, stigmas sessile.

Tr.

A native of Finnmark.

LXXVIII.

SALIX CINEREA, *grey willow*.

Willd. Sp. Pl. 4. 690. Fl. Lapp. ed. Sm. 296. exluso syn. Villarsii.—Villars. Dauph. v. 3. 765. t. 50. f. 7. *S. daphnoides* ex ipso auctore. Fl. Brit. Sm. v. 3. 1063. Eng. Bot. v. 27. t. 1897.

HORTUS GLASNEVINENSIS?

Charact. Ess. Specif. W.

Foliis oblongis acuminatis serratis nitidis subtus glaucis subvillosis, petiolis subvillosis stipulis simicordatis serratis deciduis, capsulis ovato-lanceolatis, stylis elongatis. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong acuminate sawed, shining, underneath glaucous, somewhat villous, leaf-stalks somewhat villous, stipules half-heart-shaped

serrated, deciduous, seed-vessels ovate-lance-shaped, style elongated. TR.

Descriptio. W.

Amenta florum fusca, infra folia collocata, *Pedunculis* foliolis aliquot minimis lanceolatis. *Stipulae* dimidiato-cordatae, utrinque serratae glandulis tribus.

Rami arboris masculae glabri, foemineae villosi. *Folia* bi-vel tripollicaria oblonga acuminata serrata quandôque subserrata et fere integerrima, supra saturate viridia glabra nitida, subtus glauca subvillosa. *Petioli* villosi. *Amenta* foeminea sesquipollicaria. *Squamae* lanceolatae villosae. *Germina* ovato-lanceolata subsessilia glabra. *Stylus* longissimus. *Stigmata* quatuor crassiuscula. *Willd. l. c.*

Description.

The catkins of the flowers are brown and situated below the leaves, peduncles, or flower-stalks, with a few very small lance-shaped folioli or leaflets. Stipules half-heart-shaped, serrated on both edges, and furnished with three glands.

Branches of the male tree smooth, of the female villous. Leaves 2 or 3 inches long, oblong, pointed, serrated, after some time, somewhat serrated, and almost very entire, upper surface deep green, smooth and pointed, underneath glaucous and somewhat villous. Leaf-stalks villous. Female catkins an inch and a half long. Scales lance-shaped, and villous. Seed-buds ovate-lance-shaped, not quite destitute of a foot-stalk, and smooth. Style exceedingly long. Stigmas four and somewhat thick. TR.

Willdenow states, that this willow is to be found in somewhat watery marshy woods in Lapland, Sweden, England, and the south of France,

Charact. Ess. Specif. SM.

Foliis subintegerrimis ovato-lanceolatis; subtus reticulato-venosis glaucis subvillosis, stipulis semicordatis serratis. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor 20 aut 30 pedalis. Rami læves, nitidi, rubicundi; juniores pubescentes. Folia petiolata sesquiuncialia, ovato-lanceolata, acuta; supra glabra, viridia, nitida, lævia;

subtus glauco-cinerea, brevissimè villosa, sub-rubiginosa, venis prominentibus parallelis, venulis reticulatis; inferiora omnino integerri-
ma; superiora plùs minùs serrata. Stipulæ parvæ, semicordatæ, serratæ, margine reflexæ, utrinque villosæ uti petioli, deciduæ. "Amen-
ta brevissima, densissima," *Villars*.

S. cinerea *Witheringii* ab hac planta di-
versa est *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves somewhat entire ovate-lance-shaped; under surface reticularly veiny glaucous some-
what villous, stipules semicordate and serrated.
Tr.

Description.

A tree about 30 or 40 feet high. Branches smooth and even, shining, rubicund or in-
clining to redness; the young ones pubescent. Leaves foot-stalked, an inch and a half long, inversely egg-lance-shaped, acute; upper sur-
face smooth, green, polished, smooth and even; underneath of a glaucous ash-colour, very de-
licately villous, somewhat rusty, with promi-
nent parallel veins, the small veins reticulated;

the inferior leaves altogether very entire; the upper ones more or less serrated. Stipules small, half-heart-shaped, serrated, bowed on their margins, villous on both surfaces as well as the foot-stalks and deciduous; "according to *Villars* very dense and very short catkins."

The *S. cinerea* of Withering is a very different willow from this. TR.

Observations.

Doctor Smith (Eng. Bot. l. c.) believes this willow may not be very uncommon, but he observes it is the most difficult to determine. He knows not from what part of Norfolk Mr. Crowe brought the very plant, whence the specimens were taken, and which he and Mr. Crowe studied together several years, at various seasons, and determined it to be the true Linnæan *cinerea*, as well as a distinct species. It flowers after the middle of April.

He further observes that it is a small crooked and apparently useless tree, though in Fl. Brit. he observes it is 20 or 30 feet high. It is, he remarks, allied on the one hand to *S. oleifolia*; but the flower buds and cat-

kins are not so large, nor the stipulas vaulted nor rounded; and on the other hand to *S. aquatica*, with some of whose various forms it is most likely to be confounded. The leaves however are always more lanceolate, more thick and downy, not thin and pliable. The stipulas, as far as Doctor Smith has observed, are always half heart-shaped. The catkins are rather larger than in *aquatica*. The earlier or lower leaves in both these species, but especially *cinerea*, are sometimes many of them quite entire. Doctor Smith saw the male plant only.

Doctor Smith (Eng. Bot. J. c.) believes this willow may not be very uncommon, but he observes it is the most difficult to determine. He knows not from what part of Norfolk Mr. Crowe brought the very plant, whence the specimens were taken, and which he and Mr. Crowe studied together several years, at various seasons, and determined it to be the true *Linnaea cinerea* as well as a distinct species. It flowers in the middle of April.

The further observes that it is a small crooked and apparently useless tree, though in 1741 he observes it is 20 or 30 feet high. It is, he remarks, allied on the one hand to *S. alba*; but the flower buds and cat-

LXXIX.

SALIX BICOLOR, Willd.—*Hercynian*

willow.

Willd. Sp. Pl. 4. 691.

Charact. Ess. Specif.

Foliis ellipticis recurvatis acutis integerri-
mis supra nitidis glabris subtus, glaucis pu-
bescentibus, petiolis basi dilatatis, amentis
ellipticis. Willd. Arb. 359.

Descriptio.

Frutex quinquepedalis, ramis fuscis, juni-
oribus pubescentibus. *Folia* pollicaria v. ses-
quipollicaria elliptica utrinque rotundata, api-
ce breve acumine instructa integerrima, supra
saturate viridia nitida glabra, subtus glauca
pilis brevibus adpressis tecta. *Petioli* basi
valde dilatati. *Amenta* præcocia elliptica
pollicaria. *Squamæ* lanceolatae margine vil-
losæ. *Filamenta* alba. *Antheræ* subrotundæ

flavæ. *Folia* in ramis junioribus quandoque obsolete remotissime serrata. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptic, recurved or bent backwards, acute, very entire, upper surface polished and smooth, underneath glaucous and pubescent, with their petioli or foot-stalks dilated at their base; catkins elliptical. *TR.*

Description.

A shrub 5 feet in height, branches brown, the earlier ones pubescent. Leaves an inch or an inch and a half long, elliptical, rounded off on each side, their extremities furnished with sharp points, very entire, upper surface deep green, polished and smooth, underneath glaucous, and covered with sharp pressed down hairs. The petioli or leaf-stalks very much dilated. Catkins appear early in the spring, are of an elliptic form and an inch long. Scales lance-shaped and villous on their margins. Filaments white. Antheræ roundish and yellow. The leaves on the earlier branches in time become obscurely and very remotely serrated. *TR.*

Willdenow examined the male of this willow in a living state. He informs us that it is a native of Hercynia.

LXXX.

SALIX JACQUINIANA, Willd.—*Jacquin's willow.*

Willd. Sp. Pl. 4. 692. Jacq. Aust. t. 409. *S. fusca.*

Charact. Ess. Specif.

Foliis ellipticis integerrimis utrinque attenuatis nitidis glaucis, venis subtus et margine pilosis, germinibus ellipticis pubescentibus stylis elongatis. Willd. l. c.

Descriptio.

Rami teretes fusci, juniores pubescentes. *Folia* semipollicaria et majora elliptica vel obovata, utrinque attenuata viridia nitida margine ciliata pilis longis, subtus in venis pilis

sparsis obsita et reticulato-venosa. *Stipulae* magnae oblongae apicem versus serratae reticulatae. *Amenta* foeminea cylindracea gracilia. *Squamae* lanceolatae pilosae. *Germina* elliptica, pilis adpressis tecta. *Stylus* longus. *Stigma* bifidum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptical very entire attenuated or thinned on each side, shining, smooth, with veins underneath and their margins hairy; seed-buds elliptical, pubescent, with elongated or lengthened out styles. TR.

Description.

Branches rounded, brown, the early ones pubescent. Leaves half an inch long or more, elliptical or inversely egg-shaped, attenuated, on both sides green, polished, and their margins ciliated with long hairs, underneath covered with hairy scattered veins, and besides reticularly veiny. Stipules large, oblong towards their extremities, sawed and reticulated. Female catkins cylindrical and slender. Scales lance-shaped and hairy, seed-buds elliptical, and covered with close pressed

hairs. Style long. Stigma bifid or cloven in two. TR.

Willdenow examined the female of this species of willow in a dry state. Found in Alpine situations in Austria.

LXXXI.

SALIX MÜHLENBERGIANA, Willd.—*Mühlenberg's willow*.

Wild. Sp. Pl. 4. 692. Mühlenb. Nov. Act. Soc. Nat. Scrut. Berol. 4. p. 241. t. 6. f. 9. Michaux * Amer. 2. p. 223.

Charact. Ess. Specif.

Foliis lanceolatis acutiusculis subintegerrimis pubescenti-canis, subtus tomentosis

* Andreas Michaux, &c. &c. published in 2 vols. 8vo. with 51 plates, **FLORA BOREALI-AMERICANA**, or a Flora of the United States of America—this celebrated author is well known by his large work on American Oaks, in French—translated and published by the author of this Essay.

rugoso-venosis, germinibus ovato-lanceolatis villosis pedicellatis. *Willd. l. c.*

Descriptio.

Frutex pedalis vel quadripedalis sæpius decumbens, ramis pubescentibus. *Folia* pollicaria et majora, lanceolata acutiuscula integerrima quandoque denticulo uno alterove obsolete dentata supra cana pubescentia, subtus albo-tomentosa rugoso-venosa. *Stipulae* deciduae breve lanceolatae. *Amenta* foeminea quadrilinearia. *Squamæ* oblongæ margine villosæ. *Germina* longe pedicellata ovato-lanceolata sericeo-villosa. *Stylus* brevis. *Stigmata* crassiuscula, quadrifida. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, somewhat acute and entire, pubescently hoary, underneath downy, roughly veiny, seed-buds ovate lance-shaped, shaggy, and foot-stalked. Tr.

Description.

A shrub a foot or 4 feet high, frequently decumbent, the branches pubescent. Leaves

above an inch long, lance-shaped, somewhat acute, very entire, after some time dentated obscurely with one or two denticles or small teeth, upper surface hoary and pubescent, underneath whitely downy and roughly veiny. Stipules deciduous, and shortly lanceolated. Female catkins four lines long. Scales oblong and shaggy on their margins. Seed-buds with long pedicles or foot-stalks ovate, lance-shaped and covered with a silky shag. Style short. Stigmas somewhat thick, and quarifid, or cloven into four parts. Tr.

Willdenow examined the female of this willow in a dry state. Found in gravelly situations in Pensylvania and Canada.

LXXXII.

SALIX TRISTIS, *narrow-leaved American willow.*

Willd. Sp. Pl. 4. 693. Hort. Kew. Aiton.
v. 3. 393. ed. 1.

Charact. Ess. Specif.

Foliis lanceolatis utrinque attenuatis integerrimis supra glabriusculis, subtus rugoso-venosis tomentosis. *Willd. l. c.*

Observatio.

Accedit ad præcedentem, sed forma foliorum et stipularum absentia diversa.

Ess. Specif. Charact.

Leaves lance-shaped, thinned on each side, very entire, upper surface somewhat

smooth, underneath roughly veiny, and downy.
TR.

Observations.

It resembles somewhat the former (*S. Muhlenberg*) but differs in the form of the leaves, and the want of stipules. TR.

Willdenow saw this willow only in a dry state, and without catkins.

It is a native of Pensylvania.

LXXXIII.

SALIX ARGENTEA, *silky sand willow*.

Willd. Sp. Pl. 4. 693.—Fl. Brit. Sm. v. 3. 1059. Eng. Bot. v. 19. t. 1364.

HORTUS GLASNEVINENSIS. III.

Charact. Ess. Specif. w.

Foliis ellipticis integerrimis recurvato-acutis, supra pubescentibus, subtus sericeo-pilosis argenteis, germinibus ovato-lanceolatis villosis.
Willd. l. c.

Descriptio. w.

Frutex tripedalis, ramis fuscis pubescentibus, junioribus sericeo-argenteis. *Folia* semipollicaria, quandoque pollicaria, subrotundo-elliptica et lanceolato-elliptica integerrima, supra canescentia, subtus argenteo-sericea.

Amenta unguicularia præcocia. *Squamæ* lanceolatae villosæ. *Germina* ovato-lanceolata villosa. *Stylus* brevis. *Stigma* quadrifidum crassiusculum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptical, very entire, recurvedly acute, upper surface pubescent, underneath silkily hairy, and silvery; seed-buds ovate-lance-shaped and villous. TR.

Description.

A shrub of three feet high, branches brown and pubescent, the early ones covered with a silky silveriness, or silkily silvery. Leaves from half an inch to an inch long, roundish elliptic, and lanceolately elliptic, very entire, upper surface hoary, underneath silverly silky. Catkins appearing early in the spring and unguicular or clawed. Scales lance-shaped and villous. Seed-buds ovate lance-shaped and villous. Style short. Stigma quadrifid or parted into four, somewhat thick. TR.

Willdenow examined this willow in a living state, and informs us that it grows in sandy pastures in Germany.

Charact. Ess. Specif. SM.

Foliis integerrimis ellipticis subrevolutis mucronulatis aduncis: suprâ subvillosis; subtùs ramulisque sericeo-argenteis. *Fl. Brit. l. c.*

Descriptio. SM.

Caules diffusi, vel prostrati, ramis elongatis patentibus, densè foliosis, subangulatis, sericeis. Folia sparsa, petiolata, ferè uncialia, elliptica, integerrima, subrevoluta, mucronulo reflexo terminata, suprâ tomento raro, adpresso, seu pilis subsericeis, demum deciduis, tecta: subtùs undique sericeo-nitidis. Stipulæ exiguæ, villosæ, glandula mucronatæ, sæpe nullæ. Amenta ramorum apicem versùs cylindracea, obtusa, squamis ellipticis obtusis sericeis. Capsulæ pedicellatæ, ovato-lanceolatæ, sericeæ, demum glabratae. Stigmata bipartita. *Fl. Brit. l. c.*

Observatio. SM.

Hanc speciem aut plane ignoravit Linnæus, aut cum *S. fuscâ*, ut ego in *Fl. Lapp. ed. 2*, confudit. Differt à *fuscâ* foliis rotundioribus, nunquam, non integerrimis, apice

aduncis; ramulis crassioribus, densius foliosis; amentis subterminalibus, habituque longè magis sericeo ac nitido. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves very entire elliptical, somewhat revolute or their margins rolled backwards, sharp pointed and hooked, or adunque; upper surface somewhat villous, underneath silkily silvery as well as the branches. TR.

Description.

A shrub with diffuse stems, or prostrate, the branches elongated, spreading, thickly leafy, somewhat angled, and silky. Leaves scattered, foot-stalked, nearly an inch long, elliptical, very entire, somewhat revolute, or their margins turned backwards, and their extremities terminated by a small reflexed point; upper surface covered with a thin wool pressed very close, or somewhat silky hairs, and ultimately dropping off; under surface totally covered with a silky gloss. Stipules exceedingly small, villous, pointed with a gland, frequently none. Catkins towards the extremities of the branches cylindrical, obtuse,

with elliptic obtuse silky scales. Seed-vessels foot-stalked, ovate lance-shaped, silky and ultimately smoothened. Stigmas cloven in two. TR.

Observations.

Linnæus was either entirely unacquainted with this species of willow, or he confounded it with *S. fusca* hereafter to be considered, as noticed by Doctor Smith in his edition of the Flora Lapponica. It differs however from *S. fusca* in the leaves being more round, always very entire, and their extremities hooked; the twigs more gross, and more thickly covered with leaves, the catkins rather terminal, and altogether in appearance more silky and shining. TR.

Doctor Smith (Eng. Bot. l. c.) informs us, that it is a native of loose blowing sandy ground on the sea shore in various parts of England, Scotland, and Wales, where its silvery brilliancy renders it conspicuous, and where it flowers abundantly in May.

It varies in size and luxuriance. The branches are long, and more or less spreading, or nearly prostrate; the young ones angular and silky. Leaves on shortish stalks,

elliptical, broad, about an inch long, always perfectly entire, somewhat revolute, terminating in a bluntish recurved point; their upper side green, veiny and smooth when fully grown, the under covered with beautiful silvery close-pressed hairs. Stipulæ variable in size, ovate, flat, entire, silky. Catkins cylindrical, obtuse, at first sessile. Scales linear, inclining to ovate, obtuse or notched, hairy. Stamina yellow, smooth. Capsules on very long stalks, ovate-lanceolate, silky. Style short. Stigmas at length cloven. By age the capsules become smooth.

Male catkins in abundance, woolly, pressed down very close to the young leaves, which so thickly cover the branches. Squamæ or calyx scales notched and blackish. Stamens two and small. Nectarium very small. *Wade.*

LXXXIV.

SALIX PARVIFOLIA, *small-leaved dwarf-*
willow.

Eng. Bot. v. 28. t. 1961.

HORTUS GLASNEVINENSIS ?

Ess. Specif. Charact.

Leaves elliptical, nearly entire, with re-
curved points; glaucous and silky beneath.
Stem decumbent. Stipulas ovate, entire. *Eng.*
Bot. l. c.

Observations.

Doctor Smith informs us, that this species of
willow was gathered by the late Mr. Crowe at
East Winch and Wrongay fen, Norfolk. And
after having been cultivated in his garden for
several years along with *S. repens*, *fusca*, *pros-*
trata, and *ascendens*, the next to be considered,

it has constantly preserved its habit and characters, and cannot be confounded with any other willow.

It flowers at the end of April, or early in May. The stem is much branched, entangled and decumbent. Branches elongated, wand-like, a foot or 18 inches long, spreading obliquely or less procumbent, very densely clothed with innumerable leaves, round, thickish, and veiny or silky. Leaves spreading or recurved, about half an inch long, of a broad elliptical figure with recurved points; the margin slightly revolute, either quite entire, or marked here and there with a minute glandular tooth. The upper surface is of a dull lightish green and nearly smooth; the under glaucous and more or less silky. Footstalks very broad and short. Buds large, ovate, silky. Stipulas usually present but small, ovate, entire, hairy, tipped with a red gland. Female catkins ovate, dense, yellowish. Scales obovate, brown, hairy. Germen stalked, silky, at length becoming nearly smooth. Style short, thick. Stigmas deeply divided, thick, blunt.

Living specimens of this plant, shut up for two or three days in a tin box, diffuse when opened an intolerably fish-like scent, which Doctor Smith never observed in any

other willow, except *ascendens* the next to be considered.

LXXXV.

SALIX ASCENDENS, *ascending dwarf*
willow.

Eng. Bot. v. 28. t. 1962.

HORTUS GLASNEVINENSIS?

Ess. Specif. Charact.

Leaves elliptic-oblong, somewhat serrated, with recurved points; glaucous and silky beneath. Stems ascending. Stipulas ovate, serrated. *Eng. Bot. l. c.*

Observations.

Observed by Mr. Crowe and Mr. E. Forster upon Portland heath, Norfolk. Doctor Smith noticed it in several moist heathy or

sandy places, but long supposed it a variety of *S. argentea*, from which, having cultivated and examined it for a number of years, he now finds it widely and unquestionably distinct. That species, when left to itself, always forms an upright bush, and is remarkable for its brilliant silvery leaves, which are always entire. The present is a creeping low shrub, with long, straight, obliquely ascending branches, and much less silvery leaves even on their under-side. The leaves are also much more oblong, and many of them decidedly serrated. It is most akin to the last considered (*S. parvifolia*) and has the same smell, but is about twice as large, with less crowded recurved leaves, and with serrated stipulas. It flowers with that species in May, 2 or 3 weeks later than the *repens* hereafter to be considered. The female catkins and capsules agree with those of *parvifolia*. Doctor Smith does not find such marks of discrimination in the parts of fructification in this tribe of willows, as in the larger kinds, nor has he had opportunities of verifying their species by raising them from seed. He observes that *S. caprea aquatica*, *oleifolia*, *hirta*, *cotinifolia* &c., as well as *purpurea*, *Helix*, &c. have grown from seed in Mr. Crowe's garden; and prove as permanent in habit and characters as any plants in the world.

LXXXVI.

SALIX REPENS, *creeping dwarf willow*.

Willd. Sp. Pl. 4. 693. Hoffman Sal. v. 1. 63. t. 15, 16, *S. depressa*. Fl. Brit. Sm. v. 3. 1061. Eng. Bot. v. 3. t. 183.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. W.

Foliis elliptico-lanceolatis integerrimis acutis
subtus subsericeis, capsulis demum glabris,
caule depresso exstipulato. *Willd. l. c.*

Description. W.

Caulis crassitio digiti. *Rami* virgati, decumbentes. *Ramuli* adpersi villis albis. *Folia* ovata s. ovato-oblonga, integerrima, utrinque glabra, subtus glauca, petiolata, stipulis nullis; infima opposita transversim et parum

pilosa. Amenta lateralibus. Fœminis capsulæ rufescentes. Willd. l. c.

Ess. Specif. Charact.

Leaves elliptically lance-shaped, very entire, acute, underneath somewhat silky; seed-vessels ultimately becoming smooth, with a depressed stalk, without stipules. TR.

Description.

Stem the thickness of a finger. Branches twiggy, and lying on the ground. The young twigs sprinkled over with white wool. Leaves ovate, or ovally oblong, very entire, smooth on both surfaces, under one glaucous, foot-stalked, no stipules; the lower ones opposite, and transversely a little hairy. Catkins lateral. Seed-vessels rufescent or somewhat red. TR.

Willdenow examined it in a living state, and he tells us that it grows in sandy situations in Germany, Sweden, and France.

Charact. Ess. Specif. SM.

Foliis integerrimis elliptico-lanceolatis submucronulatis: suprâ nudiusculis; subtus glaucis sericeisque, caule depresso. *Fl. Brit. l. c.*

Descriptio. SM.

Caules procumbentes, repentes et radicantes, ramosissimi, lignosi et rigidi, ramis divaricatis implexis, glabris, vel apice tantum sericeo-pubescentibus. Folia brevius petiolata, elliptico-lanceolata, longitudine varia, integerrima, subrevoluta, mucronulo brevi recto terminata; suprâ omninò glabra vel rarius pilosa, subtus glauca, atque sæpius sericea. Stipulæ nullæ. Amenta numerosa, lateralia, alterna, brevialia, obtusa, squamis obovatis, obtusis, pilosis, rubicundis. Capsulæ pedicellatæ, lanceolatæ, pubescentes, demum glabratae fuscae. Stigmata bipartita.

Varietatum limites vix inveniuntur. Differt a *S. fusca* et *prostrata* magnitudine minori, habitu vix sericeo, amentis numerosissimis, ramulis implexis, depressis, brevioribus; at præcipuè a *S. fusca* discrepat foliis omnibus

semper integerrimis, nec margine scilicet glandulosis, neque denticulatis. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves very entire elliptically lance-shaped, somewhat sharply pointed, upper surface rather naked and destitute of hairiness; underneath glaucous and silky, with the stems pressed down to the ground. TR.

Description.

Stems procumbent, creeping, and taking root, very much branching, woody and rigid, the branches divaricated or straddling, matted together, smooth, or only with a silky pubescence at their extremities. Leaves with short foot-stalks, elliptically lance-shaped, varying in length, very entire, somewhat revolute or their margins turned backwards, terminated by a short straight mucronula or small point; upper surface altogether smooth or more rarely hairy; underneath glaucous and more frequently silky. Stipules none. Numerous, lateral, alternate, short, obtuse catkins, scales inversely egg-shaped, obtuse, hairy, and reddish. Seed-vessels foot-stalked, lance-shaped, pubescent, at length

smoothened and brown. Stigmas cloven in two.

The limits of the varieties have scarcely been ascertained. This low willow differs from *S. prostrata* and *fusca*, in being much smaller, scarcely silky in appearance, the very numerous catkins with which it is furnished, and the shorter, matted, pressed down small branches—it differs from *S. fusca* principally, in having the leaves always very entire, that is to say, their margins not supplied with glands, nor denticulated or furnished with small teeth.
TR.

Observations.

Doctor Smith states, that every moist sandy heath in Great Britain abounds with this willow, which flowers in May, and ripens its fruit in June and July, when, as in most of this genus, the leaves arrive at their full size. The varieties of *S. repens* are numerous, differing in the breadth of their leaves and in the greener and browner colour of the whole plant. He further observes, that the real one figured in English Botany has a very strong woody root, dark brown or black, throwing out many prostrate or widely spreading stems, of which the flower branches are generally erect. The leaves are lanceolate or elliptical-

silky when young and seldom quite smooth beneath when old; without stipulæ. Catkins not long; scales obtuse, hairy. Germen oval, silky, with a short undivided style, and a yellow spreading stigma, cloven almost equally into 4 lobes. Ripe capsule, smooth, lanceolate. The style and stigma must be particularly noticed in discriminating some of these small willows. Male catkins ovate-oblong, opposite, and richly abundant. Squamæ or calyx scales ligulated or strap-shaped, ciliated, obtuse, and crenated, blackish brown at their extremities. Stamina two, filiform, straight, and long, with small round anthers. Nectarium foot-stalked, and truncated.

Female catkins, before expansion, reddish or rosy, small, and ovate-oblong. Squamæ sphacelated at their extremities, truncated, strap-shaped and hairy; seed-vessels cylindrical, and hairy. Stigmas quadrivalvular, and a little revolute. *Wade.*

LXXXVII,

SALIX FUSCA, *brownish dwarf willow.*

Willd. Sp. Pl. 4. 694. Willd. Arb. 341.
S. arenaria. Fl. Lapp. ed. Sm. 299. t. 8. f.
 r. Fl. Brit. Sm. v. 3, 1060. Eng. Bot. v. 28.
 t. 1960.

HORTUS GLASNEVINENSIS ? IV.

Charact. Ess. Specif. w.

Foliis elliptico-lanceolatis subintegerrimis
 acutis, glabris, subtus sericeo-tomentosis, sti-
 pulis lanceolato-subulatis, capsulis lanceolatis
 pedicellatis sericeis, *Willd. l. c.*

Observatio. w.

Gemma univalvis, bipartita, Amentum abs-
 que foliis.

Differt a *S. argentea* *foliis* elliptico-lanceolatis supra glabris subdenticulatis, ramis junioribus non argenteo-sericeis, *stipulis* minoribus: a *S. repente* *foliis* subdenticulatis, subtus argenteo-sericeis et præsentia stipularum. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptically lance-shaped, somewhat entire acute smooth, underneath silkily downy, stipules lance-awl-shaped, seed-vessels lance-shaped, foot-stalked, and silky. TR.

Observation.

A bud of one valve, and cloven in two.

A catkin without leaves.

It differs from *S. argentea* in having the leaves elliptically lance-shaped, underneath smooth and a few small teeth on their margins, the early branches not covered with a silvery silkiness, stipules smaller.

From *S. repens* in having the leaves somewhat denticulated, underneath of a silvery silkiness, and having stipules. TR.

Willdenow informs us, that it is found in sandy situations in Germany and Sweden.

Charact. Ess. Specif. SM.

Foliis subdenticulatis elliptico-oblongis acutis; suprà glabris; subtùs glaucis sericeis, petiolis attenuatis. *Fl. Brit. l. c.*

Descriptio. SM.

Caules erecto-patentes, ramulis rectiusculis, pubescentibus, subangulatis. Folia sparsa, petiolata, vix uncialia, elliptico-oblonga, acutiuscula, apice recta; margine haud revoluta, nequaquam integerrima, sed denticulis raris, sparsis, glandulosis, in adultioribus et superioribus magis conspicuis et numerosis, munita; supra fusco-viridia, vel omninò glaberrima, vel pilis raris, exiguis, adpressis, albis, conspersa; subtùs glauca, subsericea, venulis tenuissimis, anastomosantibus. Petioli demùm elongati, pilosi, nultò magis quam in prostrata attenuati. Stipulæ vix ullæ. Ramuli floriferi laterales, breves, ut in *S. repente*. Amenta cylindracea, obtusa, vix uncialia, squamis pilosis; masculinis obovatis, obtusis, pallidis, apice fusco-sanguineis; fœmineis lanceolatis, angustioribus, unicolori-

bus. Stamina flava. Capsulæ pedicellatæ, subulatæ, sericeo-villosæ. Stigmata bipartita. *Fl. Brit. l. c.*

Observatio.

Exemplaria a D. Stuartio missa cum archetypo originali, in Fl. Lapponicâ descripto, prorsus conveniunt. In herbario Linnæi aliud exemplar adest, nomine *S. incubacæ* insignitum, quod *S. fusca* foliis adultioribus mihi omnino videtur; at hoc nullius est auctoritatis ad *Salicem incubacæ* (quæ mihi valdè obscura) determinandam, cum neque signo necessario antiquitatis, ad priorem Spec. Plant. editionem spectante, gaudeat, neque hujusce characteri specifico benè respondeat.

S. fusca Hoffmanni parvitate sua, amentis terminalibus, solitariis, foliisque utrinque glabris saturatè viridibus, ab hac et *S. prostrata* facili dignoscenda videtur. Faciem insuper habet *S. repentis*. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves somewhat furnished with small teeth on their margins, elliptically oblong, and acute; upper surface smooth; underneath

glaucous and silky, with their foot-stalks attenuated. TR.

Description.

Stems erectly spreading, small branches or twigs somewhat straightish, pubescent and somewhat angular. Leaves scattered irregularly, foot-stalked, scarcely an inch long, elliptically oblong, somewhat sharp and straight at their extremities; their margins not revolute or turned backwards, by no means very entire, but armed with scattered glandulous scarcely perceivable, small teeth, more conspicuous and numerous in the full grown and upper leaves; upper surface brownish green, either altogether very smooth, or strewn over with exceedingly small, pressed down, white, subtile hairs; underneath glaucous, somewhat silky, with exceedingly delicate anastomosing small veins. The petioli or leaf-stalks at length become elongated, hairy, much more attenuated than in *S. prostrata*. Stipules scarcely any. The catkin bearing lateral small branches, short, as in *S. repens*. Catkins cylindrical obtuse, scarcely an inch long, and the scales hairy, males inversely egg-shaped, obtuse, pale, and of a brownish sanguine colour at their extremities; females lance-shaped, narrower and of one colour. Stamens yellow. Seed-vessels foot-stalked,

awl-shaped, silkily villous. Stigmas cloven in two. TR.

Observations.

The specimens sent by Mr. Stuart, with the original document, as described in Flora Lapponica, altogether agree. In the Linnæan herbarium there is another instance, under the name of *S. incubacea*, which appears to Doctor Smith to be altogether *S. fusca* with the leaves in their full grown state; but this is no authority for determining *S. incubacea*, which appears as yet to Doctor Smith to be altogether very obscure, especially when it does not bear the necessary mark of former times, observed in the first edition of the *Species Plantarum*; neither does it correspond well with the specific character given to this very specimen.

S. fusca of Hoffman, on account of its smallness, terminal solitary catkins, the leaves smooth on both sides and deep green colour, is sufficiently and easily distinguished from our *S. fusca* and *prostrata*. Moreover it has the appearance of *S. repens*. TR.

Doctor Smith informs us, that this willow is not rare on moist mountainous heaths in the north of England, flowering in May.

He further states that its stem forms an upright bushy shrub, about a foot high, very much branched, not creeping, as far as he could observe from the cultivating it for many years, though Linnæus says otherwise. Branches round, downy when young, thickly clothed with leaves. Buds large, ovate, red and shining. Leaves on longish slender foot-stalks, always, Doctor Smith believes, without stipulas, scarcely an inch long, elliptic-oblong, sharpish, almost perfectly flat and straight not revolute, their margin not cut nor serrated, but beset with distant glandular teeth, most conspicuous in the older ones: dark green and smoothish above; glaucous and silky with minute veins, beneath. In drying they turn black or brown. Catkins ovate, short and dense, with brown hairy obtuse scales. Anthers red before they burst. Nectary ovate, brown. The scales of the female catkins, sent for the same species by Doctor Stuart to Doctor Smith and described as before from Flora Brit., are so different as to cause a doubt of their identity. Doctor Smith is certain of the distinctness of this species, though possibly Linnæus may have confounded some others with it, and led him to describe the stem as creeping. Doctor Smith moreover believes that *S. repens* is best distinguished from this the *fusca* by its creeping stem, the leaves being not always entire;

LXXXVIII.

SALIX PROSTRATA, *prostrate dwarf willow*.

Willd. Sp. Pl. 4. 695.—Fl. Brit. Sm. v. 3. 1060. Eng. Bot. v. 28. t. 1959.

HORTUS GLASNEVINENSIS. IV. V.

Charact. Ess. Specif. W.

Foliis elliptico-lanceolatis subserratis acutis, supra glabris, subtus glaucis, sericeis, caule prostrato. *Willd. l. c.*

Observatio.

Folia supra viridia opaca subtus in juventute sericeo-argentea, in statu adulto glauca serricea. Accedit ad *S. fuscam*, sed folia supra non nitida et petioli tenuiores. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptically lance-shaped, somewhat serrated, acute, upper surface smooth, underneath glaucous and silky, with a prostrate stem. TR.

Observation.

Leaves, upper surface green and opaque, underneath in their young state silkily silvery, when fully grown glaucous and silky. TR.

This willow resembles much *S. fusca*, but the leaves on their upper surface are not glossy, and the petioli or leaf-stalks are more slender. TR.

Found on wet mountains in Silesia.
Willd.

Charact. Ess. Specif. SM.

Foliis subdentatis ellipticis acutis: subtus glaucis sericeis, caule prostrato. *Fl. Brit. l. c.*

Descriptio. SM.

Caules prostrati, ramis elongatis, attenuatis; junioribus subsericeis. Folia sparsa, brevius petiolata, vix uncialia, elliptica sive elliptico-lanceolata, hinc inde dentata, vix revoluta, acuta; suprâ saturatè viridia, obsoletè venosa, parùm pubescentia; subtùs glauca, subsericea. Stipulæ nullæ. *Fl. Brit. l. c.*

Observatio. SM.

A. S. argente adiffert cauli ramisque omninò prostratis, minùsque pubescentibus, foliis angustioribus hinc inde denticulatis vel subserratis, longè minùs nitidis, vix revolutis, vel apice aduncis. A. S. fuscâ, præter caulem prostratum, petiolis brevibus incrassatis dignoscitur. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves somewhat toothed, elliptic and acute underneath glaucous and silky, with a prostrate stem. TR.

Description.

Stems prostrate, branches engthened out, attenuated, in their early state somewhat silky.

Leaves scattered, with short foot-stalks, scarcely an inch long, elliptical or elliptically lance-shaped, here and there toothed, scarcely revolute, and acute; the upper surface dark green, obscurely veiny, a little pubescent; underneath glaucous, and rather silky. Stipules none. TR.

Observations.

It differs from *S. argentea*, in its stem and branches being altogether prostrate, and much less pubescent, the leaves narrower, and here there their margins furnished with small teeth or somewhat sawed, a great deal less glossy, scarcely revolute, or their extremities hooked.

It is distinguished from *S. fusca*, besides having a prostrate stem, the petioli or leaf-stalks are shorter and thickened. TR.

Doctor Smith states in Eng. Bot. that Mr. Crowe received this little willow many years ago from Mr. Dickson, who found it in Scotland, and that it has ever since preserved its original habit in the garden. Mr. E. Foster gathered what Doctor Smith finds to be the same on Epping Forest, near High beech; but neither Mr. Crowe nor any other person, to Doctor Smith's knowledge, has found it in Norfolk.

Doctor Smith further observes, that the stems of this small shrub form an entangled mat, most of the branches being very long, tough, straight and slender, spreading very widely, close to the ground, in all directions, while some few ones stand erect. All are leafy, round, finely downy when young. Leaves scattered, on shortish thick stalks elliptical or elliptic-lanceolate, scarcely an inch long, acute, somewhat recurved, mostly entire, but here and there furnished with one or two conspicuous teeth; above dark and opaque, minutely downy, veiny, convex; beneath concave, hardly revolute, glaucous, rugged with veins, and somewhat silky. Stipulas rare and small, or merely little glands. Sometimes the scales of the axillary buds look like stipulas.

Catkins produced in May, not earlier, ovate, obtuse, dense, silky. Scales with a blunt brown tip. Germen ovate, silky, somewhat stalked. Style short and thick. Stigmas cloven.

Female catkins rather slender and alternate. Squamæ red at their extremities, truncated and semibifid. Seed-vessels foot-stalked. Stigmas bifid. Nectarium small and slender. *Wade.*

LXXXIX.

SALIX SCHRADERIANA, Willdenow.—*Schraderian willow.*

Willd. Sp. Pl. 4. 695. *S. discolor*, Schrader*.

Charact. Ess. Specif.

Foliis elliptico-oblongis acutis apice obsolete serratis, supra nitidis, subtus glaucis villosis. *Willd. l. c.*

Observatio.

Admodum affinis *S. bicolori*, sed folia minora et serraturis parum remotis a medio ad

* Professor Schrader of Gottingen is well known by his various observations on Natural History, particularly in his Journal, and his "*Commentatio super Veronicis spicatis*," on his obtaining the professorship of physic at Gottingen.

apicem instructa. *S. fuscae* magnitudine ac forma foliorum similis, sed folia subtus glauca villosa, nec sericea. *Willd. l. c.*

Ess. Specif. Charact.

Leaves elliptic-oblong acute, obscurely serrated at their extremities, upper surface glossy, underneath glaucous and shaggy. *Tr.*

Observation.

Very like *S. bicolor* of *Willdenow*; but the leaves are less, and the serratures on their margins from the middle to the extremities are a little remote. It bears a resemblance to *S. fusca*; but the leaves underneath are glaucous and villous, not silky. *Tr.*

Willdenow saw the male of this willow in a dry state, and he informs us, that it is a native of Germany.

XC.

SALIX HIRSUTA, *hairy East-Indian*
willow.

Willd. Sp. Pl. 4. 695. Thunb. Prod. 6.

HORTUS GLASNEVINENSIS ?

Foliis integerrimis utrinque hirsutis exstipulatis ovatis mucronatis. *Thunberg. l. c.*

Leaves very entire, hairy on both sides, without stipules, egg-shaped and ending in a sharp point. TR.

A native of the Cape of Good Hope.

XCI.

**SALIX PYRENAICA, ciliated Pyrenean
willow.**

Will. Sp. Pl. 4. 696. Gouan. Illust. 77.
exclasis synonymis.

Charact. Ess. Specif. W.

Foliis ellipticis integerrimis obtusis subtus
glaucis rugoso-venosis utrinque pilosis, ger-
minibus ovato-lanceolatis villosis, caule pros-
trato. *Willd. l. c.*

Descriptio. W:

Caules prostrati spithamaei et pedales, ra-
mosi fusci, ramis junioribus flavescentibus
pilosis. *Folia* semipollicaria elliptica acuta
integerrima supra viridia pilosa, margine pilis
albis ciliata, subtus glauca, rugoso-venosa, ju-
niora utrinque villosa. *Petioles* pilosi. *Amenta*
fœminea semipollicaria. *Squamæ* lanceolatæ

pilosæ. *Germina* ovato-lanceolata villosa.
Stylus mediocris. *Stigma* bifidum. *Willd.*
l. c.

Ess. Specif. Charact.

Leaves elliptical, very entire acute, underneath glaucous, roughly veiny, both surfaces hairy, seed-buds ovate lance-shaped and shaggy, with a prostrate stem. *Tr.*

Description.

Stems prostrate a span and a foot long, branching and of a brown colour, the young branches yellowish and hairy. Leaves half an inch long, elliptic, acute, very entire, upper surface green, hairy, and ciliated on their margins with white hairs, underneath glaucous, roughly veiny and hairy, the very young ones shaggy on both surfaces. Petioli or leaf-stalks hairy. Female catkins half an inch long. Scales lance-shaped and hairy. Seed-buds ovally lance-shaped, and villous. Style of a middling size. *Stigma* cloven in two. *Tr.*

Willdenow saw the female of this willow in a dry state, and he tells us that it is a native of the Pyrenean mountains.

XCII.

SALIX HIRTA, *hairy branched willow*.

Willd. Sp. Pl. 4. 696. Eng. Bot. v. 20.
t. 1404.

HORTUS GLASNEVINENSIS. IV.

Ess. Specif. Charact. SM.

Leaves elliptic-heart-shaped, pointed, finely notched, downy on both sides. Stipulæ half-heart shaped, flat, toothed, nearly smooth. Branches hairy. *Eng. Bot. l. c.*

Observations.

Doctor Smith tells us, that Mr. Crowe discovered this Willow in Norfolk some time since; but, as is the case with some others, Doctor Smith was not sufficiently acquainted with its distinctive marks to admit it into

his *Flora Britannica*. On further examination however it appears to be distinct. It flowers in April or early in May, and is most allied to *S. cotinifolia* and *oleifolia*, but the following marks will serve to discriminate it.

In height it is a small tree. The branches are thick, and most remarkably hairy with very close prominent horizontal hairs. Leaves 2 inches long of a broad elliptical figure, heart-shaped at their base, and ending in a sharp point; their edges furnished with shallow notches rather than teeth or serratures; their upper side dullish green; the under pale or glaucous, finely veined, both clothed with fine short pubescence. Foot-stalks longish, very hairy. Stipulæ nearly smooth, flat, half-heart-shaped, acute, minutely toothed. Male catkins cylindrical, rather slender. Scales somewhat acute, brown, hairy. Nectary blunt and papillary. Stamina, yellow, long.

The leaves in drying are inclined to turn black.

Male catkins, solitary, terminal, ovate-oblong or club-shaped and very hairy. Squamæ pale-brown at their extremities, a reddish tinge throughout, and very hairy.

Stamens long, flat, and hairy, straw-coloured. Anthers simple, or didymous, incumbent, and reddish before bursting, afterwards lemon-coloured, with abundant pollen. Nectaria two and three, with a substance somewhat like a young germen near some of them. Could it be an hermaphrodite floret?

The leaves, which are very hairy, come forth tolerably sized, with the amenta or catkins, *Wade.*

XCIH.

SALIX DICKSONIANA, *glaucous bilberry-leaved willow.*

Fl. Brit. Sm. v. 3. 1056. *S. myrtilloides*.

Fl. Lapp. ed. Sm. 2. 295. t. 8. f, i., k.

Eng. Bot. v. 20. t. 1390. *S. Dicksoniana*.

Char. Ess. Specif.

Foliis ellipticis acutis obsoletè denticulatis glabris subtùs glaucis, ramulis glaberrimis.
Fl. Brit. Sm. l. c.

Descriptio.

Frutex pedalis, erectus, ramosus. Ramuli fusco-virides, glaberrimi. Folia vix uncialia, patentia, plana, elliptica, acuta, obsoletè denticulata vel subserrata, denticulis apice glandulosis, haud integerrima, aliquantulum revo-

luta; supra lævissima, lætè viridia; subtùs glauca, tenuissimè venulosa; utrinque glaberrima. Petioli breviusculi, basi incrassati. *Fl. Brit. Sm. l. c.*

Essent. Specif. Charact.

Leaves elliptic acute obsoletely denticulated, smooth underneath, glaucous; little branches very smooth. *Tr.*

Description.

A shrub a foot high, erect, and branching. The little branches brownish green, and very smooth. Leaves scarcely an inch long, spreading, plain, elliptic, acute, obsoletely finely toothed or half-sawed, the teeth with glands at their extremities, not very entire, a very little or somewhat revolute, or their margins rolled backwards, upper surface very soft and even, bright green; underneath sea-green, most delicately veiny, very smooth on both sides. Leaf-stalks rather short, and thickened at their base. *Tr.*

Observations.

Doctor Smith, having only seen the leaves of this willow when *Fl. Brit.* was written, referred it, though not without doubt, to *S. myrtilloides* of Linnæus; its catkins however, which were produced in the spring of 1805, clearly proved it to be a new species, to which he now gives the name of that very eminent botanist, who first found it on the Scottish mountains, and from whose growing specimens, cultivated by Mr. Crowe, the figure and description in *Eng. Bot.* are taken.

It is a small upright branched shrub, about a foot high, flowering in April, quite smooth in all its branches, leaves and stalks. Stipulæ very minute, like those of *S. carinata* before noticed. Leaves on short thickish foot-stalks, flat elliptical, acute with obsolete teeth or serratures; the upper surface very even and bright green; the under glaucous, finely veined. Female catkins ovate, very short, being like those of *S. rosmarinifolia* hereafter to be considered, in shape but erect. Scales dark purplish brown, concave, notched, hairy. Germen stalked, ovate, silky, with a short style, and thick yellow notched stigmas.—The germens of the true *myrtilloides* are

quite smooth, the catkins cylindrical and lax, and the leaves perfectly entire. Doctor Smith has not seen a British specimen of this willow.

XCIV.

SALIX INCUBACEA.

Willd. Sp. Pl. 4. 696. Jacq. Collect. *
3. p. 48. *S. angustifolia*.

Charact. Ess. Specif.

Foliis lanceolatis utrinque attenuatis integerrimis convexis supra glabris subtus incanis subsericeis, germinibus lanceolatis sericeis, stigmatibus subsessilibus. *Willd. l. c.*

* N. I. Jacquin, Collectanea ad Botanicam, Chemiam, et Historiam Naturalem spectantia. Voll. 4. et Supplementum. Vindobonæ, 1786.—1796. 4to.

Descriptio.

Frutex bi-vel tripedalis ramis flavis. *Folia* pollicaria lanceolata integerrima utrinque attenuata, supra viridia glabra, subtus cana pilisque adpressis obsita, juniora sericea, nunquam plana, semper convexa. *Stipulae* oblongae deciduae. *Amenta* praecocia oblonga unguiculata. *Squamae* lanceolatae sericeo-pilosae. *Germine* lanceolata sericea. *Stylus* vix ullus. *Stigmata* quatuor crassiuscula. *Willd. l. c.*

Observatio.

Valde affinis *S. rosmarinifoliae*, sed diversa *foliis* convexis nec planis, *stigmatibus* sessilibus. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, thinned on both sides, very entire, convex, upper surface smooth, underneath hoary somewhat silky, seed-buds lance-shaped and silky, stigmas somewhat sessile. TR.

Description.

A shrub two or three feet high, with yellow branches. Leaves an inch long, lance-shaped, very entire, attenuated on both sides, upper surface green and smooth, underneath all over hoary, and covered with pressed down hairs, the young leaves silky, never flat, always convex. Stipules oblong and deciduous. Catkins appearing early in the spring, oblong and unguiculated. Scales lance-shaped, silkily hairy. Seed-buds lance-shaped and silky. Style scarcely any. Stigmas four and somewhat thick. TR.

Observations.

Willdenow examined this willow in a living state. He tells us, that it is to be met with in wet sandy situations in Germany, Sweden, and Carniola, that it is very like *S. rosmarinifolia*, but differs in its leaves being convex, not flat as in *S. rosmarinifolia*, and the stigmas being sessile. TR.

XCV.

SALIX ROSMARINIFOLIA, *rosemary-leaved*
willow.

Willd. Sp. Pl. 4. 697. Fl. Brit. Sm. 3.
1062. Eng. Bot. v. 19. t. 1365.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. w.

Foliis lineari-lanceolatis subintegerrimis
planis, supra pubescentibus, subtus sericeis
germinibus lanceolatis villosis, stylis elongatis.
Willd. l. c.

Descriptio. w.

Folia subtus nitida, sericea, villosa. *Frutex*
pedalis vel tripedalis ramis bruneis, ramulis sub-
sericeis. *Folia* pollicaria lineari-lanceolata, sero
autumno vero glaberrima, subtus sericeo-pubes-

centia, margine integerrima sed sub lente observata denticulis paucis remotissimis glandulosis instructa. *Stipulae* lanceolato-subulatæ sericeæ. *Amenta* præcocia, mascula unguicularia elliptica, foeminea cylindræa, paulo majora. *Squamæ* oblongæ obtusæ margine pilis longis instructæ. *Germina* lanceolata villosa. *Styli* longi. *Stigmata* bina cylindræa. Willd. l. c.

Ess. Specif. Charact.

Leaves linear-lance-shaped somewhat entire, level, upper surface pubescent, underneath silky, seed-buds lance-shaped and villous, styles elongated. TR.

Description.

Leaves underneath glossy, silky, and villous. A shrub two or three feet high, with tawny branches, the young ones pubescent. Leaves an inch long, linear-lance-shaped, upper surface hoary, and covered with pressed down hairs, but late in the autumn they become very smooth, underneath silkily pubescent, their margins very entire, but under a glass they appear to be furnished with a few very remote glandular small teeth. Stipules lance-awl-shaped and silky. Catkins appearing early in the

spring, unguicular and elliptic, female cylindrical and a little larger than the male. Scales oblong, obtuse, and their margins furnished with long hairs. Seed-buds lance-shaped and villous. Styles long. Stigmas double and cylindrical. TR.

Willdenow examined this willow in a living state, and he informs us that it is to be met with in sandy, and wet turfy situations in Sweden and Germany.

Charact. Ess. Specif. SM.

Foliis integerrimis lineari-lanceolatis strictis; subtus sericeis, caule erecto, stipulis erectis planis. *Fl. Brit. Sm. l. c.*

Description. SM.

Caulis tripedalis, erectus, vel erectiusculus, ramosus. Rami viminei, recti, densè foliosi, juniores sericei. Folia brevius petiolata, erecta, stricta, subsesquiuncialia, lineari-lanceolata, acuta, integerrima, margine subindè glandulosa; suprà pubescentia, ætate plùs minùs glabrata; subtus sericeo-villosa. Stipulæ erectæ, lanceolatæ, planæ, subintegræ. Amenta lateralialia, brevia, cernua. *Fl. Brit. Sm. l. c.*

Ess. Specif. Charact.

Leaves very entire, linear-lance-shaped, narrow, underneath silky, stem erect, with straight plane stipules. TR.

Description.

Stems three feet high, erect or rather somewhat erect, and branching. Branches twiggy, straight, very full of leaves, and the early ones silky. Leaves with short foot-stalks, erect, narrow, about an inch and a half long, linear-lance-shaped, acute, very entire, their margins now and then glandular; upper surface pubescent, and more or less becoming smooth, as they grow old; underneath silkily villous. Stipules erect, lance-shaped, plain, and rather entire. Catkins lateral, short, and bending downwards. TR.

Observations.

Doctor Smith tells us, that it is found in moist sandy places in several parts of Great Britain, especially in the North. Mr. Crowe received it from Mr. Dickson. It flowers in April.

He further observes, that it is an erect shrub, about 3 feet high, divided into very numerous, upright, round, slender, leafy branches, silky when young. Leaves on short slender stalks, nearly upright, straight, an inch and a half or more in length, linear-lanceolate, acute, entire, though sometimes a little glandular at the edge; downy above when young, but becoming smooth and dark-green with age; silky and glaucous at all times underneath. Stipulæ generally very upright, flat, lanceolate, rarely divided. Catkins lateral, nearly sessile, ovate, very short, most remarkable for being always recurved. Scales elliptical, small, black, hairy. Germen on a longish stalk, ovate-lanceolate, silky. Stigmas dark purple, almost black, ovate, at length cloven, with a shortish style.

Female catkins small and hairy. Squamæ, linear, long, truncated, bidentated, blackish brown, and some reddish. Seed-buds small, obovate, with long slender foot-stalks. Stigmas reddish brown, bifid, trifid, and quadrifid. Nectarium minute. *Wade.*

XCVI.

SALIX RIPARIA, Willden.—*Lavender-leaved
Saltzburg willow.*

Sp. Pl. Willd. 4. 698. Schrank, * Bavar.
1. p. 230. *S. incana*. Schrank. Salisb. n.
38. Lapeyrouse. † *S. lavandulifolia*. Vill.
Delph. 3. p. 785. *S. viminalis*.

Charact. Ess. Specif.

Foliis lineari-lanceolatis glanduloso-denti-
culatis basi integerrimis supra pubescentibus,
subtus tomentosis, rugoso-venosis, germinibus
ovatis glabris *Willd. l. c.*

* Professor Schrank of Erlang.

† Figures de la Flora des Pyrenées, par. Phil. Picot
Lapeyrouse, Tome 1. Paris, 1795. fol.

Descriptio.

Frutex orgyalis ramis nigro-fuscis, junioribus pubescentibus. *Folia* bipollicaria linearilanceolata acuminata a medio ad apicem denticulis parvis glandulosis margine instructa, supra viridia pilis sparsis adpressis canescentia, subtus nivea tomentosa et rugosa. *Petoli* albo-tomentosi. *Stipulae* obsoletae. *Amenta* praecocia, mascula pollicaria, foemineaque sesquipollicaria. *Amenta* mascula cylindracea. *Squamae* oblongae obtusae flavae glabrae apice pilis paucis tenuibus instructae. *Filamenta* flavescentia. *Antherae* ellipticae flavae. *Amenta* foeminea cylindrica. *Squamae* ovatae obtusae fuscae glabrae apice quandoque pilis aliquot instructae, qui saepius desunt. *Germina* ovata glabra. *Stylus* brevis apicè bifidus. *Stigmata* fusco-purpurea crassiuscula bifida. *Willd.* l. c.

Ess. Specif. Charact.

Leaves linear lance-shaped, glandularly toothed, very entire at their base, upper surface pubescent, underneath downy and roughly veiny, seed-buds ovate and smooth.
TR.

Description.

A shrub a span long, with blackish brown branches, the young ones pubescent. Leaves

two inches long, linear-lance-shaped, acuminate, their margins from the middle to the extremities furnished with small glandular teeth, upper surface green with scattered pressed down hairs, hoary, underneath white as snow, downy, and roughly veiny. Petioli or leaf-stalks covered with a white down. Stipules obscure. Catkins appearing in the spring, male ones an inch long, females an inch and a half—males cylindrical. Scales oblong, obtuse, yellow, smooth, with a few delicate hairs at their extremities. Filaments yellowish. Anthers elliptic and yellow. Female catkins cylindrical, and their scales ovate, obtuse, brown, smooth, in some time furnished with a few hairs on their extremities, but more frequently they are wanting. Seed-buds ovate and smooth. Style short and cloven in two at its apex. Stigmas brownish purple somewhat thick and bifid. Tr.

Willdenow, who examined this willow in a living state, informs us that it grows in mountainous situations on the banks of rivers, in Austria, Pannonia, the Tyrolese country, Salzburg, and the south of France.

XCVII.

SALIX ANGUSTIFOLIA, Willd.—*Narrow-leaved willow.*

Willd. Sp. Pl. 4. 699. Fl. Ros. Pall. p. 74? *S. Caspica.*

Charact. Ess. Specif.

Foliis linearibus angustissimis ovatis exstipulatis subintegerrimis supra canis, subtus sericeis *Willd. l. c.*

Description.

Rami teretes fusci, juniores sericei. *Folia* sesquipollicaria vel bipollicaria angustissima linearia vix lineam lata acuta integerrima vel margine denticulis sparsis glandulosis remotissimis instructa, supra canescentia pilis adpressis sparsis oblecta, subtus sericea. *Petiol*i dilatati glabri. *Amentum* non vidi. *Willd. l. c.*

Observatio.

Ab omnibus cognitis foliis angustissimis et longis diversa. *Salix Caspica Pallasii* cum nostra exacte convenit, sed glabra dicitur. *Willd. l. c.*

Ess. Specif. Charact.

Leaves linear exceedingly narrow ovate without stipules, rather very entire, upper surface hoary, underneath silky. *Tr.*

Description.

Branches round and brown, the young ones silky. Leaves an inch and a half or two inches long, exceedingly narrow, linear, scarcely a line broad, acute, very entire or their margins furnished with scattered glandular and very remote small teeth, upper surface hoary and covered with scattered pressed down hairs, underneath silky. Petioli or leaf-stalks dilated, and smooth. Catkin has not been seen. *Tr.*

Observation.

This sallow is distinguished from all the other species by its very narrow leaves. The *Salix Caspica* of Pallas exactly agrees with this species, but it is said to be smooth. Tr.

Willdenow, who examined it in a dry state and without catkins, informs us that it is found in tracts of land towards the Caspian sea.

XCVIII.

SALIX GRISEA, Willdenow.—*Ash-coloured*
Pensylvanian willow.

Willd. Sp. Pl. 4. 699, Muhlenb. Nov.
Act. Soc. Nat. Scrut. Berol. 4. t. 6. f. 8. *S.*
sericea.

Charact. Ess. Specif.

Foliis lanceolatis acuminatis serrulatis supra glabris, subtus sericeis, germinibus sericeis oblongis, stigmatibus sessilibus. *Willd. l. c.*

Descriptio.

Frutex orgyalis ramis fuscis, junioribus pubescentibus. *Folia* sesquipollicaria lanceolata acuminata serrulata supra glabra nervo medio tomentoso. *Petoli* longi sericei. *Stipulae* lineares caducae sericeae. *Amenta* praecocia, mascula cylindracea semipollicaria.

Squamæ oblongæ, sphacelatæ margine albo-villosæ. *Filamenta* alba. *Antheræ* ellipticæ flavæ. *Amenta* foeminea unguicularia elliptica. *Squamæ* oblongæ obtusæ sphacelatæ margine albo-villosæ. *Germina* oblonga sericeo-villosa. *Stigmata* bina crassa obtusa sessilia. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, acuminate, finely sawed, upper surface smooth, underneath silky, seed-buds silky and oblong, stigmas sessile. **TR.**

Description.

A shrub of a span's length, with brown branches, the young ones pubescent. Leaves an inch and a half long, lance-shaped, pointed, finely sawed, upper surface smooth with a downy middle nerve. Leaf-stalks long and silky. Stipules linear, and caducous or falling off soon, silky. Catkins appearing early in the spring, males cylindrical and half an inch long, their scales oblong sphacelated, with a white villous down on their margins. Filaments white. Anthers elliptic and yellow. Female catkins unguicular and elliptic, their scales oblong,

obtuse, sphacelated, with a white villous coat on their margins. Seed-buds oblong and silkily villous. Stigmas, two, thick, obtuse and sessile. Tr.

Willdenow examined this species of willow in a dry state, and he tells us that it is found in marshy situations in Pennsylvania.

× XCIX.

SALIX AMBIGUA, *ambiguous willow*.

Willd. Sp. Pl. 4. 700. Ehrh. *S. ambigua*.

Charact. Ess. Specif.

Foliis ellipticis utrinque rotundatis recurvato-acutis, supra glabris, subtus incano-tomentosis rugoso-venosis, apice obsolete sericeis.

Willd. l. c.

Description.

Frutex parvus. *Rami* fusci. *Folia* vix pollicaria elliptica utrinque rotundata cum acumine brevi recurvato, margine integerrima quandoque ad apicem obsolete serrata, supra saturate viridia glabra, subtus rugosa reticulato-venosa incana tomentosa. *Stipulae* oblongae acutae integerrimae petiolo duplo breviores. *Amenta* mascula oblonga obtusa semipollicaria praecocia, foeminea mihi ignota. *Willd. l. c.*

Observatio.

Quasi medium inter *S. fuscam* et *auritam*. *W.*

Ess. Specif. Charact.

Leaves elliptical, rounded off on each side and recurvedly acute, upper surface smooth, underneath hoarily downy, roughly veiny, and their extremities obscurely silky. *Tr.*

Description.

A small shrub. Branches brown. Leaves scarcely an inch long, elliptical, rounded off

on each side with a short acumen or sharp point curved backward, their margins very entire, but in time their extremities become obscurely sawed, upper surface deep green and smooth, underneath rough, reticularly veiny, hoary and downy. Stipules oblong, acute, very entire, by the half shorter than the leaf-stalks. Male catkins oblong, obtuse, half an inch long, and appearing early in the spring; the female catkins unknown to Willdenow. Tr.

Observation.

It would appear as if this willow should hold its station between *S. fusca* and *S. aurita*.
Tr.

A native of Germany.

c.

SALIX SPATHULATA, Willdenow.—*Spatulate-leaved willow.*

Willd. Sp. Pl. 4. 700.

Charact. Ess. Specif.

Foliis lanceolato-ovatis recurvato-acutis apice serratis, supra pubescentibus, subtus rugoso-venosis tomentosis, stipulis lanceolatis.
Willd. l. c.

Descriptio.

Frutex quinquepedalis, ramis fuscis pubescentibus. *Folia* pollicaria interdum fere sesquipollicaria lanceolato-ovata vel spathulata recurvato-acuta integerrima apice serrata, supra e viridi canescentia pilis brevibus adspersis tecta, subtus incana vel subsericea

tomentosa reticulato-venosa rugosa. *Stipulæ* lanceolatae integerrimæ petiolis duplo breviores. *Amenta* mascula præcocia semipollicaria cylindræa. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lancely egg-shaped recurvedly acute, sawed at their extremities, upper surface pubescent, underneath roughly veiny and downy; stipules lance-shaped. TR.

Description.

A shrub five feet high, with brown pubescent branches. Leaves an inch, and sometimes almost an inch and a half long, lance-shaped ovate or spatulate-formed, that is, of a roundish figure tapering into an oblong base, recurvedly acute, very entire, serrated at their extremities, upper surface from a green hoariness, covered with short pressed down hairs, underneath woolly or somewhat silky and downy, reticularly veiny and rough. Stipules lance-shaped, very entire and twice as short as the petioli or leaf-stalks. The male catkins appear early in spring, half an inch in length and cylindrical. TR.

Willdenow examined the male only of this willow in a living state. A native of Germany.

CI.

SALIX AURITA, *round-eared willow, trailing
sallow.*

Willd. Sp. Pl. 4. 700. Fl. Lapp. ed. Sm.
303. t. 8. f. y. Ehrh. Arb. 39. Hoffman.
Sal. t. 22. f. 1. Fl. Brit. Sm. 3. 1064. Eng.
Bot. v. 21. t. 1487.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. W.

Foliis obovatis recurvato-acutis apice undulato-serratis, supra viridibus pubescentibus subtus cano-villosis, rugoso-venosis, stipulis subsemicordatis dentatis, capsulis lanceolatis pedicellatis, stigmatibus sessilibus. *Willd. l. c.*

Ess. Specif. Charact.

Leaves inversely egg-shaped recurvedly acute, wavedly serrated at their extremities, upper surface green and pubescent, underneath downily villous, roughly veiny, stipules rather half-heart-shaped, and toothed, seed-vessels lance-shaped and with foot-stalks, stigmas sessile. TR.

Willdenow examined this willow in a living state, and he informs us that it is to be met with all over Europe in wet woods.

Charact. Ess. Specif. SM.

Foliis subserratis obovatis obtusis mucronulo adunco, utrinque villosis reticulato-venosis, stipulis polymorphis. *Fl. Brit. l. c.*

Descriptio. SM.

Arbuscula ramosissima, altitudine varia, plerumque erecta, ramis patentibus, elongatis, fusco-cinereis, incanis. Folia alterna, brevius petiolata, obovata, obtusissima, mucronulata, mucronulo reflexo, reticulato-venosa; suprà cine-

reo-virentia, molle pubescentia : subtùs villosa, incana, villo venis inserto, undique divaricato, subdepresso ; juniora subintegerrima ; adultiora medium versùs serrata, crispa et undulata. Stipulæ formâ et magnitudine variæ, sæpiùs rotundatæ, dentatæ, villosæ, venosæ, persistentes. Amenta e ramulis lateralibus brevissimis ; solitaria, cylindracea, multiflora, squamis parvis, fuscis, plùs minùs pilosis, sæpiùs obtusis. Stamina flava interdùm pilosa. Capsulæ longiùs pedicellatæ, subulatæ, villosæ. Stigmata subsessilia, crassa, indivisa.

Huc potius spectat *S. ulmifolia*, *Villars Dauph.* v. 3. 776. t. 51. f. 20. quam ad *S. cineream* in *Fl. Lapp.* ed. 2. ex errore retuli. *Fl. Brit. l. c.*

Ess. Specif. Character.

Leaves somewhat sawed, obtuse, with a hooked small point at their extremities, villous and reticularly veiny on both surfaces with stipules assuming various forms. TR.

Description.

A very branching small tree, of various heights, most commonly erect, with hoary,

elongated, brownish ash-coloured spreading branches. Leaves alternate, with short foot-stalks, inversely egg-shaped, very obtuse, pointed, those small points hooked, and their surfaces reticularly veiny; upper surface ash-coloured green, and softly pubescent; underneath shaggy, hoary, with hair or wool upon the veins, on every side divaricated, and somewhat flattened vertically; the young leaves somewhat entire; when fully grown serrated towards their middle, curled and waved. Stipules vary much in size and appearance, more frequently they are rounded, toothed, villous, veiny and persistent. Catkins proceed from the very short lateral branches, are solitary, cylindrical, furnished with many flowers, small scales which are brown, more or less hairy, and more frequently obtuse. Stamina yellow, sometimes hairy. Seed-vessels with long foot-stalks, awl-shaped and villous. Stigmas somewhat sessile, thick and undivided. TR.

The *S. ulmifolia* of Villars's Flora of Dauphiny v. 3. 776. t. 51. f. 20. belongs rather to this species of willow, than to *S. cinerea*, which latter observation has crept into Doctor Smith's edition of Flora Lapponica by mistake. TR.

Observations.

Doctor Smith states, that this is the smallest of the tribe called salallows, is not so general a species as the *S. aquatica* immediately to be considered, and yet is found abundantly in rather moist upland woods, and more especially in the thickets or hedges of mountainous countries. In Shropshire and Wales it abounds, and is covered with its little catkins in April or May, while the leaves are just budding. He further observes, that it varies in height, but is generally in all its parts about half the size of the water-willow. The branches shoot horizontally among other bushes to a great extent, whence the Norfolk name of *trailing sallow*, (*Mr. Crowe*) The leaves vary much in size, but are known by their great ruggedness, their obovate, often obtuse form, and their hooked point. They are very hairy. The stipulas are roundish, very variable also in size. Catkins on lateral branches, scarcely half so long as those of *S. aquatica*, but like them in the structure of their parts. Male flowers lemon-coloured. Capsules downy, on longish stalks.

CII.

SALIX AQUATICA, *common willow, water-sallow.*

Willd. Sp. Pl. 4. 701. Hoff. Sal. t. 5. f. 3. *S. aurita* Fl. Brit. Sm. 3. 1065.—Eng. Bot. v. 20. t. 1437.

HORTUS GLASNEVINENSIS. III.

Charact. Ess. Specif. w.

Foliis ovato-ellipticis subserratis acutis supra viridibus pubescentibus, subtùs glaucis pilosiusculis stipulis rotundatis dentatis, germinibus pedicellatis lanceolatis villosis, stigmatibus sessilibus. *Willd. l. c.*

Leaves ovate-elliptical somewhat serrated acute, upper surface green and pubescent, underneath glaucous and hairyish, stipules

rounded off and toothed, seed-buds with foot-stalks, lance-shaped, and villous, stigmas sessile. TR.

Charact. Ess. Specif. SM.

Foliis subserratis ovato-ellipticis pubescentibus planis, subtus glaucescentibus; stipulis rotundatis dentatis, *Fl. Brit. l. c.*

Descriptio. SM.

Frutex vel arbor humilis, ramosissima, erecta, ramis junioribus incanis. Folia brevius petiolata obovata vel elliptica, plus minus acuta, plana, vix rugosa, medium versus serrata; inferiora sæpe integerrima; omnia mollia, cinereo-virentia, supra demum glabrata, subtus glaucescentia, venulosa, pilosiuscula. Stipulae rotundatae, fornicatae, dentatae, praecedente minores. Gemmae incanae. Amenta cylindracea, squamis parvis, fuscis, pilosis. Stamina flava, hirta. Capsulae pedicellatae, subulatae, villosae. Stigmata ferè sessilia, indivisa.

S. auritæ propinqua, at distincta species. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves half-sawed, inversely egg-shaped elliptic pubescent and even, underneath

rather sea-greenish ; stipules rounded and toothed. TR.

Description.

A shrub or a low tree, extremely branching, erect, the early branches hoary. Leaves with short foot-stalks inversely egg-shaped or elliptical, more or less acute, even, scarcely rough, serrated towards the middle ; the inferior leaves often very entire ; all soft, ash-coloured green, the upper surface ultimately becoming smooth, underneath sea-greenish, veiny, and a little hairy.

Stipules rounded off, arched, toothed and smaller than the former. Buds hoary. Catkins cylindrical with small, brown, hairy scales. Stamens yellow and hairy. Seed-vessels foot-stalked, awl-shaped and shaggy. Stigmas almost sessile and undivided. It is nearly allied to *S. aurita*, or the last noticed, but certainly a distinct species. TR.

Observations.

Doctor Smith says, that perhaps, as Doctor Withering remarks “ this is the most common

“ of all our willows, as well in hedge-rows
 “ as in woods.”

He further states, that it is much smaller in all its parts than *caprea*, and, as the latter naturally prefers a dry soil, the former the *aquatica* is mostly found in wet places, in a bushy form, overhanging ponds and covering swamps. Either species, he observes, will indeed grow almost any where by culture. It bears its catkins in April, which are cylindrical, with small brown-tipped hairy scales, and an oblong nectary to each. Capsules tapering, downy, on longish stalks. Stigmas entire. Style very short. The leaves vary in shape and in size, but are more or less obovate, downy and veiny; thin, soft and pliable, flat and not crisped or waved, in which latter particulars they differ greatly from those of *S. cinerea* and *aurita*.

The *S. aquatica*, or water-sallow is amongst the very early flowering species. The branches are green, brownish green, and delicately warty. Male catkins in profusion, roundish, solitary, and alternate. Squamæ obtuse, hairy, and reddish brown at their extremities. Stamens pale-yellow and twisted. Anthers very yellow, with abundant pollen. Nectarium small and thick. *Wade*.

CIII.

SALIX OLEIFOLIA, *olive-leaved willow*.

Willd. Sp. Pl. 4. 702. Fl. Brit. Sm. 3.
1065. Eng. Bot. v. 20. t. 1402.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. SM.

Foliis obovato-lanceolatis planis denticulatis acutis, subtùs glaucis hirtis; stipulis exiguis. *Fl. Brit. l. c.*

Descriptio. SM.

Frutex quadripedalis, ramis sparsis, laxè patentibus et divaricatis, tenuissimè pubescentibus. Folia patentia, rigidula, obovato-lanceolata, acuta, margine denticulato-scabra; suprà læte viridia, tenuissimè pubescentia, plana;

subtùs glauca ; reticulato-venosa, pilis brevibus ferrugineis hirta. Petioli mediocres crassiusculi, supra pubescentes. Stipulæ exiguæ, rotundatæ, subfalcatæ, planæ, adpressæ, vix dentatæ. Gemmæ incanæ. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves inversely egg-lance-shaped, even, with small teeth on their edges and acute : underneath glaucous, and hairy, with very small stipules. TR.

Description.

A shrub four feet high, with scattered branches, loosely extended and divaricated, covered with a most delicate pubescence. Leaves spreading, (that is, forming a moderately acute angle with the stem or branch) stiffish, inversely egg-lance-shaped, acute, with their margins roughishly denticulated, or rather denticulatedly rough ; upper surface pleasantly green, most delicately pubescent, and even ; underneath glaucous ; reticularly veiny with short ferruginous hairs, and hairy. Petioli or leaf-stalks moderately long, thickish, and pubescent above. Stipules very small,

rounded off and somewhat hooked, even, close pressed to the stem, scarcely toothed. Buds hoary. Tr.

Observations.

Doctor Smith's first knowledge of this willow was derived from plants sent by Mr. Dickson; but it proves to be not uncommon in hedges and coppices in Norfolk, and is most unquestionably a well defined species. It produces catkins in March, being one of the earliest of our native willows; and those catkins are larger than in any other wild species, except *S. caprea*, with which they nearly accord. The leaves however are totally different from those of *caprea*.

Doctor Smith observes that *S. oleifolia* rises from 4 to 8 or 10 feet in height, with straight slender divaricating branches, clothed with very fine short down. Leaves a little spreading, straight and somewhat rigid, tapering from the middle to the base, broader upward, acute but not pointed, slightly serrated, and oftener toothed throughout; green, flat, and finely downy above; glaucous, with numerous, prominent hairy, reticulated veins beneath, where they gradually assume more or less of a rusty hue. Foot-stalks of a moderate length,

downy. Stipulæ varying in size, but never large; roundish, sometimes cloven and notched, and when not very small they are reflexed, or vaulted. Flower buds very large, downy, brown. Male catkins shortish, very thick with an obovate, brown, hairy scale, a blunt nectary, and two distinct, long, conspicuous, golden stamina to each flower. The female Doctor Smith has not examined.

Female catkins? long, obtuse and tumid. Squamæ rather acute. Seed-bud erect. Style elongated. Stigmas quadrifid. Nectarium very small and broad. *Wade.*

CIV.

SALIX COTINIFOLIA, *quince-leaved willow*.

Willd. Sp. Pl. 4. 702. Fl. Brit. Sm. 3.
1066. Eng. Bot. v. 20. t. 1403.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. SM.

Foliis elliptico-orbiculatis obsoletè denticulatis, subtùs villosis; venis rectangulis. *Fl. Brit. l. c.*

Descriptio. SM.

Frutex bipedalis, ramis patentibus, elongatis, pubescentibus, ùndique foliosis. Folia patentia rigida, latè elliptica, sæpè orbiculata, plana, mucronulata, obsoletè denticulata; suprà tristè viri-]

dia, pubescentia, pilis raris adpressis; subtùs pallida vel glauca, hirta, reticulato-venosa, venis rectangulis, divaricatis, prominentibus. Petioli crassi pilosi. Stipulæ exiguæ, membranaceæ, marescentes. Gemmæ villosæ. Amenta fœminea semiuncialia, ovata, squamis obtusis, brevibus, pilosis, apice nigris. Germen brevius pedicellatum, lanceolatum, villosum. Stylus semibifidus. Stigmata obtusa, hinc fissa. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves elliptically orbicular, obscurely denticulated, underneath villous, with rectangular veins. TR.

Description.

A shrub two feet in height, with spreading, elongated, pubescent branches, covered all over with leaves. Leaves spreading, stiff, broadly elliptic, frequently orbicular, even, ending in a small stiff point, obscurely denticulated; upper surface heavy green, pubescent, with very delicate pressed down hairs, underneath pale or sea-green colour, hairy, reticularly veiny, the veins at right angles,

divaricated and prominent. Leaf-stalks thick and hairy. Stipules very small, membranaceous and withering. Buds villous. Female catkins half an inch long, ovate, with obtuse short hairy scales black at their extremities. Seed-buds with foot-stalks, lance-shaped, and shaggy. Style semibifid or half cloven in two. Stigmas blunt and cloven. TR.

Observations.

Mr. Dickson sent this willow to Doctor Smith from the north of England; but Doctor Smith informs us, that Mr. Crowe found it in Norfolk of a larger growth, being 6 or 8 feet high. It flowers in April, and is very remarkable for its round leaves.

He further states, that the leaves of this willow are spreading, thick and firm, on thick hairy stalks, of a very broad elliptical figure, often truly orbicular, with a little point, flat, slightly though regularly toothed, above of a dull green, clothed with little flat scattered hairs; beneath pale or glaucous, downy or hairy, their principal veins spreading at right angles from the mid-rib, nearly parallel to each other, their branches reticulated, all pale not rusty. Stipulæ small, rounded. Female catkins the only kind Doctor Smith

saw, about half an inch long when in blossom, ovate, with blunt, short, black, hairy scales. Nectary short, obtuse. Germen on a short stalk, lanceolate or somewhat ovate, downy, with a considerable style, and a pair of spreading cloven obtuse stigmas. Capsules lanceolate, downy.

In drying the leaves are apt to turn black, which is not the case with the preceding.

Female catkins oblong, hairy, alternate, with thick foot-stalks. Squamæ deep blackish brown, somewhat acute and ciliated. Germen with a very long foot-stalk. Style elongated. Stigmas two, each bifid and brown. Nectarium very small, at the base of the foot-stalk of the germen. *Wade.*

CV.

SALIX SPHACELATA, *withered-pointed willow.*

Willd. Sp. Pl. 4. 702. Hoff. Sal. v. 1.
28. t. 5. f. 4. t. 21. f. d. *S. capreae* varietas.
Fl. Brit. Sm. 3. 1068.

Charact. Ess. Specif. w.

Foliis ovato-ellipticis acutis integerrimis,
supra pubescentibus, subtus glauco-tomentosis,
apice subsphacelatis, stipulis obsoletis, capsulis
lanceolatis pedicellatis pubescentibus, stigma-
tibus sessilibus. *Willd. l. c.*

Descriptio. w.

Rami fusco-purpurei pubescentes. *Fo-*
lia pollicaria v. sesquipollicaria elliptica ovata
acuta integerrima apice subsphacelata, supra
viridia pubescentia quandoque fere glabra,
subtus glauca et tomento tenui obducta. *Sti-*
pulae nullae, rarius in ramulis junioribus mi-

nutissimæ subulatæ. *Amenta mascula* fere pollicaria oblonga crassa. *Amenta foeminea* sesquipollicaria cylindrica. *Squamæ* lanceolatæ pilosæ. *Capsulæ* pubescentes demum fere glabræ lanceolatæ pedicellatæ. *Stylus* brevissimus. *Stigmata* bina crassiuscula. Willd. l. c.

Ess. Specif. Charact.

Leaves ovate-elliptical acute very entire, upper surface pubescent, underneath glaucously downy, their extremities somewhat sphacelated, stipules obscure, seed-vessels lance-shaped with foot-stalks, and pubescent, stigmas sessile. TR.

Description.

Branches brown purple and pubescent. Leaves an inch or an inch and a half long, elliptically ovate acute very entire somewhat sphacelated at their extremities, upper surface green and pubescent, in time becoming almost smooth, underneath glaucous and covered with a thin delicate down. Stipules none, though very rarely exceedingly minute awl-shaped ones on the early branches. Male catkins oblong, almost an inch long, and

and thick. Females an inch and a half long and cylindrical. Scales lance-shaped, and foot-stalked. Style very short. Stigmas two, and somewhat thick. TR.

Willdenow, who examined this willow in a living state, informs us that it is to be met with in subalpine situations in Carinthia.

Charact. Ess. Specif. SM.

Foljis integerrimis ellipticis planis utrinque pubescentibus apice subsphacelatis, stipulis obsoletis, capsulis subulatis. *Fl. Brit. l. c.*

Description. SM.

Arbuscula. Rami ramulique subpubescentes, patentes, rubicundi. Folia petiolata, uncialia, vel sesquiuncialia, elliptica, superficie plana sive æqualia, subtenuia, integerrima vel rarissimè et obsoletè crenata; apice plerumque sphacelata, fusca; utrinque pubescentia, at subtùs densiùs tomentosa; suprà demùm ferè glabrata, inprimis apicem versùs. Stipulæ vel nullæ, vel exiguæ, sublunatæ, glandulosæ, demùm glabratae. Petioli graciles, tomentosi. Amenta lateralìa, cylindrica, uncialia, multiflora, squamis fuscis ellipticis, vel

lanceolatis, pilosis. Stamina flava. Capsulæ longiùs pedicellatæ, subulatæ, attenuatæ, villosæ, demùm penè denudatæ. Stigmata subsessilia, indivisa.

Hujus varietas videtur S. n. 19. Gmel. Sib. v. 1. 163. S. caprea v. Sp. Pl. 1448, *Herb. Linn.* foliis angustioribus, breviùs aliquantulum petiolatis, subtùsque magis sericeis.

S. lanata Linnæi certo certiùs discrepat capsulis subsessilibus, ovatis, glabrioribus, stylo elongato, stigmatibus bipartitis, quæ omnia sectionem diversam generis indicant. Huc retulit Linnæus Salicem suam depressam, *Fl. Suec.* 352. cujus folia S. nostram sphacelatam valdè referunt; capsulæ vero, quæ hanc litem facile dirimerent, in exemplario Linnæano desunt. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves very entire elliptical, even, pubescent on both surfaces, somewhat sphacelated at their extremities, stipules obscure, seed-vessels awl-shaped. TR.

Description.

A small tree. Branches and twigs somewhat pubescent, spreading and reddish. Leaves foot-stalked, an inch or an inch and a half long, elliptical, their superficies level or equal, somewhat thin, very entire or very rarely obscurely notched; their apices for the most part somewhat sphacelated, and brown; pubescent on both surfaces, but their under surface more densely downy; the upper one after some time becomes almost smooth, especially towards their extremities. Stipules either none, or exceedingly small, half-moon-shaped, glandular and at length smooth. Leaf-stalks, slender, and downy. Catkins lateral, cylindrical, an inch long, with many flowers, scales brown, elliptical or lance-shaped, and hairy. Stamina yellow. Seed-vessels with long foot-stalks, awl-shaped, attenuated, villous, at length becoming in a manner bare. Stigmas sessile and undivided.

The variety of this noticed in *Gmelin's Fl. Sibirica* v. 1. 163. S. n. 19, would seem to be *S. caprea* v. 8. Sp. Pl. 1448, in the *Linnean herbarium* with narrower leaves, somewhat more shortly foot-stalked, and underneath more silky.

The *S. lanata* of Linnæus is most certainly different in having its seed-vessels somewhat sessile, ovate, more smooth, an elongated style, and stigmas cloven, or parted in two; all of which point out the different subdivisions of the genus *Salix*. Linnæus has referred his *Salix depressa*, *Flora Suecica* 352 to this place, the leaves of which very much resemble our *sphacelata*; but the seed-vessels, which would so very easily ascertain the fact, are wanting in the specimen of Linnæus. Tr.

This species of willow has been found in valleys in the Highlands of Scotland. At Finlarig at the head of Loch Tay, Rev. Mr. Stuart. *Fl. Brit. l. c.*

CVI.

SALIX CAPREA, great round-leaved
willow.—Black willow?

Willd. Sp. Pl. 4. 703. Hoff. Sal. v. 1.
25. t. 3. f. 1, 2. t. 21. f. a, b, c. Ehrh.
Arb. 98. Fl. Brit. Sm. 3. 1067. Eng. Bot.
v. 21. t. 1488.

HORTUS GLASNEVINENSIS.

Gemmæ inferiores Folia, superiores *Amenta*
non foliacea producunt.

Arbor magna. Folia in planta juniore
quandoque fere pedalia. Willd. l. c.

The inferior buds produce leaves, the
superior catkins, and which are not leafy.

A large tree. The leaves in the young
tree at times are nearly a foot long. Tr.

Charact. Ess. Specif. SM.

Foliis ovatis acuminatis serratis undulatis, subtùs tomentosis, stipulis sublunatis, capsulis ventricosis. *Fl. Brit. l. c.*

Descriptio.

Arbor. Rami teretes, læves, nitidi, sub-fusci, ramulis pubescentibus. Folia alterna, petiolata, figurâ varia, at plerumque elliptica vel subrotunda, acuminata, magna, undulata, repanda, vel serrata, supra læviuscula, glabrata; subtùs densè tomentosa, venosa. Stipulæ lunatæ vel subrotundæ, recurvæ, repandæ, minùs tomentosæ. Petioli lineares, suprâ quandoque densiùs villosi. Amenta ante folia expansa ovata, crassa, multiflora, squamis obovatis, pilosissimis. Stamina flava. Capsulæ pedicellatae, ovatæ, basi ventricosæ, villosæ. Stigmata subsessilia, indivisa, demum subindè fissa. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves ovate acuminate sawed and waved; underneath downy, stipules half-moon-shaped, seed-vessels bellying out. TR.

Description.

A tree. Branches round and taper, shining, smooth, somewhat brown, twigs pubescent. Leaves alternate, footstalked, of various forms, but for the most part elliptical or roundish, acuminate, large, undulated, (that is, when the disk near the margin of the leaf is waved obtusely up and down) wavy, (that is, when the leaf is bordered with numerous minute glands, and small segments of circles alternately) or serrated; upper surface somewhat bare and smoothened; underneath compactly downy and veiny. Stipules moon-shaped or roundish, curved backward, wavy, less downy. Leaf-stalks linear, after some time becoming more densely villous at their junction with the leaf. Catkins, before the leaves are expanded, oval, thick, furnished with many flowers, and with inversely egg-shaped very hairy scales. Stamens yellow. Seed-vessels foot-stalked, oval, bellying out at their base and shaggy. Stigmas somewhat sessile, undivided, and ultimately now and then cloven.

Tr.

Observations.

Doctor Smith (Eng. Bot. l. c.) observes, that this willow is common in hedges and

thickets, but it prefers such situations as are rather dry than wet. Its copious yellow blossoms enliven the landscape in early spring, especially if they happen to have a black ground of gloomy firs. The wood and branches of the sallow are particularly used for making hurdles. Its bark is bitter and astringent, has lately been much recommended for the same purposes as the Peruvian bark or *Cinchona*.

This is much larger in all its parts than the *S. aquatica*, and grows to the size of a moderate tree. It is readily known by its large broad roundish leaves, which are waved at their edges, and clothed with a dense white cottony down beneath. The catkins are thicker and blunter than those of any other British species, except perhaps *oleifolia*. The scales are brown and very hairy. Stamens yellow. Germen ovate, downy, on a long stalk. Capsule swelling at the base. The scales of the flower-buds are most beautifully silvery, when they first expand.

The *S. caprea* differs in many respects from *S. aquatica* already noticed—the catkins are much larger in *caprea*, the squamæ black, more acute, and the hairs on it longer than on *aquatica*—the stamens longer and more filiform, and the antheræ filiform and small—

the filaments in aquatica are crooked or twisted, but above all the reddish brown, rather blunt, squamæ of the aquatica most readily point out the difference. *Wade.*

It is stated by Hoffman, that the twigs of this willow make excellent baskets, and the branches are used for a variety of purposes. The bark is used for tanning leather of various kinds. The common people make shoes of the bark, in the same way as they do in certain parts of Sweden from oak bark; the bark dyes linen yarn black.

The wood is white, tough, and light, and is used by fishermen for suspending their nets in the water—it makes the best charcoal, which quickly takes fire, and is esteemed for making gun powder, and for the use of the drawer is preferred to any other charcoal. The catkins afford early food for bees, and therefore it would be well worthy of having this and many other early flowering species planted about apiaries.

CVII.

SALIX CHRYSANTHOS, *golden-flowered*
Norway willow.

Willd. Sp. Pl. 4. 704. Fl. Danic. t.
 1007.

Foliis ovato-ellipticis integerrimis utrinque
 tomentosis, stipulis ovato-lanceolatis, germini-
 bus distylis. *Willd. l. c.*

Amenta pilis longis flavescentibus nitidis
 hirsutissima. *Fl. Dan. l. c.*

Germen, secundum iconem, videtur gla-
 brum, stylis duobis bifidis instructum. *Willd.*
l. c.

Leaves ovally elliptic very entire,
 downy on both surfaces, with ovate-lance-

shaped stipules, and two-styled seed-buds:
Tr.

Catkins with polished long yellowish fine
hairs, and exceedingly hairy. Tr.

The seed-bud, according to the figure
in *Flora Danica*, appears to be smooth, and
furnished with two bifid styles. Tr.

Found on the high mountains of Nor-
way.

●VIII.

SALIX FAGIFOLIA, *beech-leaved willow*.

Willd. Sp. Pl. 4. 704. Waldstein et
Kitaib. Pl. Rar. Hungar.*

Charact. Ess. Specif.

Foliis ovato-ellipticis glanduloso-mucronatis
serratis basi integerrimis glabris, subtus ad
venas hirtis. *Willd. l. c.*

* Hungary is indebted to Count Waldstein and
Doctor Kitaibel for a material part of her Flora, con-
tained in their “ *Descriptiones et Icones Planta-
rum Rariorum Hungariæ*. This Flora is enriched not
only with the products of the most northern and
southern parts of Europe, but of Asia likewise, and
even some of those of the burning regions of Africa,
besides many found exclusively hitherto in Hun-
gary. It is singular that, the *Nymphæa Lotus*, for-

Descriptio.

Rami fusci, juniores pubescentes. *Folia* sesquipollicaria ovato-elliptica serrata basi integerrima, apice mucrone glanduloso instructa, supra saturate viridia glabra, subtus pallida reticulato-venosa, venis hirtis. Juniora folia subtus pilosa. *Stipulae* reniformes glanduloso-dentatae. *Amenta* non vidi. Willd. l. c.

Ess. Specif. Charact.

Leaves ovate elliptic ending in sharp glandular points, sawed on their edges, very entire at their base, smooth, underneath hairy upon their veins. TR.

Description.

Branches brown, the young ones pubescent. Leaves an inch and a half long, ovally-

merly considered as peculiar to Egypt, grows in the river Peoze, near Great Waradein: it is stated, that this remarkable plant is found thriving in the hot wells of that place, in a temperature of 95°. of Farenheit's scale".

elliptical, sawed, very entire at their base, their extremities furnished with glandular sharp points, upper surface deep green and smooth, underneath pale, reticularly veiny, and the veins hairy. The early leaves hairy underneath. Stipules kidney-formed, and glandularly toothed. The catkins have not been seen. TR.

Willdenow examined this species of willow in a dry state without catkins.

Found on the high Croatian Mountains.

XCIX.

SALIX ACUMINATA, *long-leaved willow*,
Jargomel sallow.

Willd. Sp. Pl. 4. 704. Hoffman. Sal. v.
 1. 39. t. 6. f. 1, 2. t. 22. f. 2. Fl. Brit.
 Sm. 3. 1068. Eng. Bot. v. 20. t. 1434.

HORTUS GLASNEVINENSIS. IV. V.

Dignoscitur facile è congeneribus *foliis ob-*
longo-lanceolatis acuminatis obtuse undulato-
serratis. Willd. l. c.

It is readily known from every other
 species of sallow, by its acuminate oblong
 lance-shaped obtusely undulated sawed leaves.
 TR.

Willdenow states, that it is to be found
 in woods, and wet situations in Germany.

Charact. Ess. Specif. SM.

Foliis lanceolato-oblongis acuminatis undu-
latis denticulatis; subtùs tomentosis, stipulis

reniformibus, capsulis ovato-subulatis. *Fl. Brit. l. c.*

Descriptio. SM.

Arbor. Habitus *S. capreæ*, sed plerumque humilior. Rami teretes, subviminei, glabriusculi; juniores subsericeo-pubescentes. Folia alterna, petiolata, triuncialia, lanceolato-sive ovato-oblonga, acuminata, magis minùsve repanda et undulata, apicem versùs præcipuè denticulata; suprà lætè viridia, lævia, glabrata, subtus tomentosa, nervo rubicundo, venis arcuatis, parallelis. Stipulæ reniformes, sessiles, dentatæ, venosæ, ad folia præcipuè inferiora. Petioli ut in *S. caprea*. Amenta ovato-cylindracea, obtusa, ante folia enata, squamis ovatis, acutiusculis, pilosis. Stamina flava. Nectarium conicum constrictum. Capsulæ longiùs pedicellatæ, ovatæ, attenuatæ, pubescentes. Stylus brevissimus. Stigmata obtusa, indivisa, subindè bifida. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves lance-oblong acuminate, waved and toothed, underneath downy, stipules kidney-shaped, seed-vessels ovate-awl-shaped. *TR.*

Description.

A tree. The habit of *S. caprea*, but for the most part a much lower tree. Branches rounded and straight, somewhat twiggy and smooth, the young ones somewhat silky-pubescent. Leaves alternate foot-stalked, three inches long, lanceolately or ovate oblong, acuminate, more or less wavy and undulated, denticulated particularly towards their extremities; upper surface a pleasant green, even and smooth; underneath downy, with a reddish nerve, and arched parallel veins. Stipules kidney-shaped, sessile, toothed, veiny, particularly on the inferior leaves. Leaf-stalks as in *S. caprea*. Catkins ovally cylindrical, obtuse, and appearing before the leaves, with hairy, somewhat acute, ovate scales. Stamens yellow. Nectarium conical, and constricted or contracted. Seed-vessels with long foot-stalks, ovate, attenuated or slender, and pubescent. Style exceedingly short. Stigmas obtuse, undivided, and now and then bifid.

Tr.

Observations.

Doctor Smith states, that this tree, which rises to a moderate height and produces catkins early in April, is by no means un-

common in woods and hedges, preferring rather a moister situation than the common sallow, *S. caprea*, of which it has been considered as a variety. Miller first described it for a distinct species by the above name, and Hoffman has well illustrated it.

The branches are round, when young clothed with soft short down. Leaves on foot-stalks, about three inches long, lanceolate, acute, often dilated a little above the middle, the margin more or less waved and slightly toothed towards the point; the upper surface is smooth and green; the under finely and closely downy, with parallel curved veins, which are often reddish. Stipulæ half-ovate when young, but afterwards curved and kidney-shaped, and toothed. Catkins ovate, inclining to cylindrical, with ovate pointed hairy scales. Stamina 2, yellow. Capsule on a long stalk, ovate, tapering, downy, with a short style, and thick obtuse stigmas.

Female catkins numerous, at the extremities of the highest branches. Stigmas bifid trifid and quadrifid. Capsules twice as long as the squamæ. Male catkins ovate-oblong, hairy and before complete expansion of a brilliant red colour. Squamæ somewhat acute, small, hairy and reddish brown half

their length. Stamens very long, filiform. Anthers simple and small. Nectarium very small. *Wade.*

CX.

SALIX CONIFERA, cone-bearing willow.

Willd. Sp. Pl. 4. 705. Arb. 347. Wangerh. Amer. 123. t. 31. f. 72. Michaux, Amer. 2. p. 226, *Salix longirostis*. Nov. Act. Soc. Nat. Scrut. Berol. 4. p. 240.

Charact. Ess. Specif.

Foliis oblongo-lanceolatis remote serrulatis, supra glabris, subtus planis tomentosis, germinibus lanceolatis villosis, stylo elongato. *Willd. l. c.*

Descriptio.

Rami fusci, juniores pubescentes. *Folia* oblongo-lanceolata acuta remote minutim et

acute serrata, basi integerrima, supra saturate viridia glabra, subtus plana non rugoso-venosa molle tomentosa, sero autumnno fere glabra. *Petioli* longi. *Stipulae* mediocres lanatae quandoque integerrimae, saepius dente uno alterove praecipue basin versus instructae. *Amenta* praecocia, mascula vix pollicaria, foeminea pollicaria cylindraceo-oblonga obtusa. *Squamae* lanceolatae villosissimae. *Germina* lanceolata villosa. *Stylus* elongatus. *Stigmata* quatuor cylindracea. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong-lance-shaped remotely and finely sawed, upper surface smooth, underneath level and downy, stipules moon-shaped and somewhat toothed, seed-vessels lance-shaped and villous, style lengthened out.

TR.

Description.

Branches brown, young ones pubescent. Leaves oblong-lance-shaped, acute, remotely, minutely, and acutely serrated, very entire at their base, upper surface deep green and smooth, underneath even, not roughly veiny, and covered with soft down, late in the autumn almost smooth. Leaf-stalks long.

Stipules of a middling size, moon-shaped, in time very entire, frequently furnished with 2 or 3 teeth, particularly near their base. Catkins appear early in the spring, males scarcely an inch long, females an inch, cylindrically oblong and obtuse. Scales lance-shaped and exceedingly villous. Seed-buds lance-shaped and villous. Style elongated. Stigmas four, cylindrical.

Willdenow examined it in a living state.
A native of New England and Carolina.

CXI.

SALIX OBTUSIFOLIA, *Willdenow.* *Obtuse-leaved Lapland willow.*

Willd. Sp. Pl. 4. 705. Fl. Lappon. 367.
t. 8. f. U.

Foliis oblongo-lanceolatis basi cuneatis, superioribus acutis integerrimis rotundato-obtusis serrulatis subtus villosis. *Willd. l. c.*

Leaves oblong-lance-shaped, wedge-shaped at their base, the upper leaves acute, very entire, roundedly-obtuse and finely sawed, their under surfaces shaggy. TR.

Found in the woods, and high mountains of Lapland.

CXII.

SALIX CINERASCENS, *ash-coloured Portugal*
willow.

Willd. Sp. Pl. 4, 706. Link in Litt. S.
cinerascens.

Charact. Ess. Specif.

Foliis oblongo-obovatis acuminatis serratis subtus cano-tomentosis, capsulis lanceolatis pedicellatis tomentosis, stigmatibus sessilibus. *Willd. l. c.*

Description.

Rami teretes fusci, juniores pubescentes.
Folia bipollicaria et majora oblongo-obovata

breve acuminata serrata, supra viridia subpubescentia demum fere glabra nitida, subtus leviter tomentosa cana reticulato-venosa. *Amenta* mascula quadrilinearia oblonga; foeminea semipollicaria. *Squamæ* oblongæ villosæ. *Germina* pedicellata lanceolata tomentosa. *Stigmata* bina bifida latiuscula sessilia. *Stipulæ* lanatæ dentatæ magnæ. *Willd. l. c.*

Ess. Specif. Character.

Leaves oblong-ovate, pointed, sawed, underneath hoarily downy, seed-vessels lance-shaped, foot-stalked, downy, stigmas sessile.
TR.

Description.

Branches round and brown, the young ones pubescent. Leaves above two inches long, oblongly inversely egg-shaped short-pointed, serrated, upper surface green somewhat pubescent and ultimately becoming almost smooth and shining, underneath delicately downy, hoary and reticularly veiny. Male catkins four lines long and oblong; females half an inch long; scales oblong, villous. Seed-buds foot-stalked lance-shaped and downy. Stigmas by twos,

bifid, somewhat broad and sessile. Stipules moon-shaped, toothed, and large. TR.

Found in marshy situations in Portugal.

CXIII.

SALIX PEDICELLATA, *foot-stalked capsuled willow*.

Willd. Sp. Pl. 4. 706. Desfont. Atl. *
2. p. 362.

Foliis lanceolatis, rugosis, subtus tomentosis; capsulis pedicellatis glabris.

Affinis *S. capreæ* Linn. Folia ovato-oblonga superne rugosa, glabra, subtus tomentosa cinerea. Capsulæ glabræ, pedicellatæ, pedicello 3.-4 millemetr. longo.

* Flora Atlantica, auctore Renato Desfontaines.
T. 2. Parisiis. 4to.

Hab. ad rivulos Sbibæ in regno Tunetano.
Desfont. l. c.

Leaves lance-shaped, rough, underneath downy, with seed-vessels foot-stalked and smooth.

Bears an affinity to the *S. caprea* of Linnaeus. The leaves ovate-oblong, upper surface rough, without any pubescence, underneath downy, and ash-coloured. Seed-vessels smooth or without hairs, foot-stalked—the foot-stalks 3 or 4 inches long. Tr.

Found near rivulets at Sbiba in the Tunisian territories.

CXIV.

SALIX VIMINALIS, *common osier—osier willow—long-leaved willow.*

Sp. Pl. Willd. 4. 706. Hoff. Sal v. 1. 22. t. 2. f. 1, 2. t. 5. f. 2. t. 21. f, e, f. g. Ehrh. Arb. 69. Fl. Brit. Sm. v. 3. 1070. Eng. Bot. v. 27. t. 1898.

HORTUS GLASNEVINENSIS. III.

Fo ls subintegerrimis lineari-lanceolatis longissimis, subtus albo-sericeis, pilis squamarum amenti foeminei germine longioribus. *Willd. Arbor. 348.*

Frutex juncus, altissimus. *Gemmæ* foliaceæ et floriferæ distinctæ ut in caprea. *Folia* ante explicationem in hac revoluta. *Willd. l. c.*

Leaves somewhat entire, linear-lance-shaped, exceedingly long, underneath whitish silky, the hairs of the scales of the female catkins longer than the seed-bud. TR.

A very high rushy slender shrub. The leafy and flower-bearing-buds are distinct, as in *S. caprea*. The leaves in this species of *Salix*, before they unfold, are revolute or their margins turned backwards. TR.

Charact. Ess. Specif. SM.

Foliis lanceolato-linearibus longissimis acuminatis integerrimis subtus sericeis, ramis virgatis, stylo elongato. *Fl. Brit. l. c.*

Description.

Frutex. Rami longissimi, erecti, viminei, teretes, sericei. Folia sparsa, brevius petiolata, erectiuscula, ferè sphithamæa, lineari-lanceolata, acuminata, integerrima, subundulata; supra viridia, glabra; subtus sericeo-argentea, nervo prominente, venis numerosissimis, parallelis. Stipulæ lineari-lanceolatæ, sæpiùs nullæ. Amenta cylindræa, antè folia erumpentia, squamis subrotundis, obtusis, pilosissimis. Stamina lutea, antheris subindè fulvis. Capsulæ

sessiles, ovatae, subsericeae. Stylus elongatus, filiformis. Stigmata acuta, tenuia, indivisa. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves lance-linear-shaped, exceedingly long, sharp-pointed, very entire, underneath silky, with roddy branches and a lengthened out style. TR.

Description.

A shrub. Branches exceedingly long, erect, twiggy, round, and silky. Leaves scattered, with short foot-stalks, somewhat erect, almost a span long, linear-lance-shaped, pointed, very entire, somewhat wavy; upper surface green, and smooth, underneath of a silky silveriness, with an elevated nerve, and very numerous parallel veins. Stipules linear-lance-shaped, frequently none. Catkins cylindrical before the leaves burst forth, scales roundish, obtuse, and very hairy. Stamens yellow, anthers now and then of a deep yellow or tawny colour. Seed-vessels sessile, oval, somewhat silky. Style lengthened out, and thread-shaped. Stigmas pointed, slender, and undivided. TR.

Observations.

Doctor Smith, (Eng. Bot. l. c.) states, that the osier is one of the most common and best known of all the *Salices*, being so generally cultivated for the valuable produce of its wand-like tough and flexible branches. When allowed to grow, it forms a considerable tree, flowering late in April.

The branches are very long, straight, slender, round, and silky. Leaves longer than any other species, narrow, almost linear, acute, entire, revolute, smooth above; silky and shining beneath, with a strong rib. Stipulas linear-lance-shaped, sometimes toothed, often wanting. Catkins from distinct buds, cylindrical, with brown, rounded, hairy scales. Nectary ovate. Stamens distinct. Capsule sessile, ovate, silky. Style about as long as the capsule. Stigmas acute, long, slender, undivided.

Doctor Smith observes, that much has been said about the *Velvet osier*, as better than the common one, and that Mr. Crowe was first imposed upon with the *mollissima*, (immediately to be noticed) under that name, but it proved good for nothing. Mr. Crowe then received one so exactly like the com-

mon kind, that it seems at most not more than a variety.

Branches shining, hairy and woolly, pale brown and greenish brown, covered with glands and exceedingly tough. Leaves in some specimens 5 or 6 inches long. Stipules linear and awl-shaped. Catkins numerous, approximating, and appearing to lean to one side. Female ovate-oblong, pale brown and blackish brown, leafy and hairy. Squamæ subrotund or inversely egg-shaped and pale brown. Germen ovate. Style bifid. Stigma acute. Nectaria many, long, slender, and pellucid at their extremities. Male catkins. Squamæ pale brown, ovate-oblong and hairy. Stamens very long, and slender, with small antheræ. Nectaria as in the female. *Wade.*

Innumerable varieties are cultivated in the osier grounds in England for the basket-makers, and the same frequently under different names in different places. What are called the Dutch and wire-osiers are esteemed about London—but the basket-makers there have a variety of names for the different varieties.

CXV.

SALIX STIPULARIS, auricled osier.

Willd. Sp. Pl. 4. 708. Fl. Brit. Sm. v. 3. 1069. Eng. Bot. v. 17. t. 1214.

HORTUS GLASNEVINENSIS. IV.

Charact. Ess. Specif. Sm.

Foliis lanceolatis acuminatis obsolete crenatis, subtus tomentosis, stipulis semicordatis maximis, nectario cylindraceo. *Fl. Brit. l. c.*

Descriptio. Sm.

Frutex. Rami erecti, elongati, teretes, tomentosi. Folia alterna, petiolata, erectiuscula, ferè spithamæa, lanceolata, acuminata, inæqualitèr et obsolete crenata, suprà viridia, glabra, subtus tomentosa, nervo parùm rubi-

cundo, venis arcuatis, parallelis. Stipulæ ultra semiunciales, subpetiolatæ, semicordatæ, longiùs acuminatæ, basi præcipuè dentato-lobatæ, suprà glabræ, subtùs tomentosæ. Petioli crassiusculi, basi ampliati. Amenta ferè *S. acuminatæ*, et stigmatibus linearibus, indivisis. Nectarium cylindraceum, elongatum.

Differt a *S. acuminata* stipularum magnitudine et formâ, foliis angustioribus duplòque longioribus, nectario stigmatibusque linearibus. Habitu ad *S. viminalem* et mollissimam accedit, sed in usus œconomicos longè minùs præstat. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped pointed obscurely notched, underneath downy; stipules half-heart-shaped and very large, nectarium cylindrical. TR.

Description.

A shrub. Branches erect, elongated, round and downy. Leaves alternate, foot-stalked, somewhat standing upright, almost a span long, lance-shaped, pointed, unequal

and obscurely notched; upper surface green and smooth, underneath downy, with a nerve a little reddish, and arched parallel veins. Stipules more than half an inch long, somewhat foot-stalked, semicordate or half-heart-shaped, terminated by long acumens or points, and toothedly lobed at their base in particular, smooth above, underneath downy. Leaf-stalks somewhat thick and enlarged at their base. Catkins almost like those of *S. acuminata*, but the stigmas are linear, and undivided. Nectarium cylindrical, and lengthened out.

It differs from *S. acuminata* in the size and shape of its stipules, the leaves being narrower and twice as long, and the nectarium and stigmas being linear. In habit and very great softness it approaches very nearly the *S. viminalis*, the common osier last considered, but for economical purposes it is very inferior. TR.

Observations.

Doctor Smith tells us, that this new species of *Salix* was noticed by Mr. Crowe in osier ground near Bury. Mr. Sowerby

has formerly received it for *S. viminalis*, with which, however different, Doctor Smith thinks this has been confounded. Its merits as an osier however are so small, as to render the distinction of the two species important in an economical view.

It blossoms in March, being perhaps the earliest of the British species. The branches are upright, long, round, and clothed with a short soft brownish down, like velvet. Leaves on shortish stalks, nearly erect, about 5 inches long, lanceolate, pointed, rounded at the base, unequally and slightly crenate; green and smooth above; beneath downy, with a pale rib and many parallel curved veins. Stipulæ on short stalks, half-heart-shaped, long-pointed, toothed or cut at the base, often very large. Catkins large and thick, with obovate hairy scales. Stamina 2. Nectary long, cylindrical, obtuse. Germen on a short stalk, ovate, downy. Style a little elongated. Stigmas remarkably long, awl-shaped, recurved, undivided.

The large long stigmas, slender nectary, and conspicuous stipulæ, render it impossible to confound this species with any other at all resembling it. In structure of the fructification it most resembles the last, *S. viminalis*.

Leaves alternate, but mostly opposite. Petioli or leaf-stalks very thick and broad. Stipules large and arrow-shaped. Female catkins very long and thick, opposite and alternate, oblong, brownish and very hairy. Squamæ brown, obovate, acute, and very hairy. Germen ovate-oblong. Style elongated and slender: Stigma bifid, or rather cloven, linear and long. Nectarium slender. *Wude.*

CXVI.

SALIX HOLOSERICEA, velvet osier.

Willd. Sp. Pl. 4. 708.—*S. mollissima*, Fl. Brit. 3. 1070 ?

Charact. Ess. Specif.

Foliis lanceolatis acuminatis apice denticulatis, supra glabriusculis, subtus rugoso-venosis, mollissime tomentosis; stigmatibus sessilibus. *Willden. l. c.*

Descriptio.

Rami fusci, juniores pubescentes. *Folia* bipollicaria et fere tripollicaria lanceolata acuminata, a medio ad apicem denticulata, supra saturate viridia glabriuscula vel pilis minutissimis adpressis obsita, costa media pubes-

cente, subtus costa media prominula, venis lateribus arcuatis prominentibus, tomento tenui mollissimo obducta. *Petioli* pubescentes basi dilatati. *Stipulae* parvae lunatae acutae, vel obtusae, dentatae. *Amenta* foeminea precocia cylindracea pollicaria. *Squamae* oblongae obtusae villosae. *Germina* lanceolata tomentosa. *Stigmata* bina ovata obtusa sessilia. *Willd. l. c.*

Observatio.

Habitu accedit ad *S. viminalem*, sed abunde diversa, foliis subtus rugoso-venosis tomentosis opacis, et stylo nullo. *Willd. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped sharp-pointed, toothed at their extremities, upper surface somewhat smooth, underneath roughly veiny, covered with exceedingly soft down, and the stigmas sessile. *Tr.*

Description.

Branches brown, the early ones pubescent. Leaves from two to almost three inches long, lance-shaped, ending in awl-shaped points, from their middle to their extremities slightly toothed; upper surface deep green, somewhat smooth or covered all over with very minute pressed down hairs, the middle rib pubescent, underneath a somewhat standing out middle rib, arched broad prominent veins, and spread over with a very soft delicate down. Leaf-stalks pubescent, and dilated at their base. Stipules small, moon-shaped, sharp or obtuse, and toothed. Female catkins appear early in the spring, are cylindrical and an inch long. Scales oblong, obtuse and villous. Seed-buds lance-shaped and downily shaggy. Stigmas by twos, ovate, obtuse, and sessile. TR.

Observations.

This *Salix* has the appearance of our common osier (*S. viminalis*) but is a very distinct species and abundantly different, the under side of its leaves being roughly veiny,

downy, opaque or dark, and no style.
Tr.

Willdenow examined it in a living state, and he informs us that it is to be met with in Germany on the banks of the Danube.

CXVII.

SALIX MOLLISSIMA, Smith.—*Silky-leaved willow.*

Willd. Sp. Pl. 4. 708. *S. holosericea*?
Willd. Baumz. 349. Ehrh. Arb. 79. Fl. Brit.
Sm. 3. 1070. Eng. Bot. v. 21. t. 1509.

HORTUS GLASNEVINENSIS?

Charact. Ess. Specif.

Foliis lanceolatis acuminatis subcrenatis
subtùs sericeo-incanis, stipulis lunatis mini-
mis. *Fl. Brit. l. c.*

Descriptio.

Frutex. Rami erecti, viminei, tenacissimi, teretes, glabrati. Folia alterna, petiolata, ovato-lanceolata, acuminata, regularitèr at leviùs crenata, tenuia, suprà viridia, lævia et glaberrima; subtùs sericea, tactu mollissima, nervo rubro prominulo, venis arcuato-divaricatis. Stipulæ exiguæ, lunatæ, obtusæ, dentatæ, pilosæ. Petioli attenuati, pubescentes, basi paululum dilatati. Amenta nondum apud nos protulit. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped, ending in awl-shaped points somewhat notched; underneath silkily hoary, stipules half-moon-shaped, and very small. TR.

Description.

A shrub. Branches erect, twiggy, very tough, rounded, and smooth. Leaves alternate, foot-stalked, ovate-lance-shaped, acuminate, regularly but slightly notched and thin,

upper surface green, bare, and very smooth ; underneath silky, and exceedingly soft to the touch, with a somewhat standing out red nerve, and divaricated arched veins. Stipules very small, half-moon-shaped, obtuse, toothed and hairy. Leaf-stalks attenuated, somewhat breadthened at their base. The catkins have not as yet (1804) appeared in England. Tr.

Observations.

Doctor Smith (Eng. Bot. an. 1805.) informs us, that Mr. Crowe discovered this salix in osier grounds, near Bury in Suffolk. It has not been seen any where else in England, but Doctor Smith's specimens exactly accord with those of Ehrhat, before he saw which he had fixed upon the same specific name as he, Ehrhat, has chosen. Doctor Smith further observes, that he has erred in taking this for the true velvet osier, (as so named in his Flora Britannica) a valuable plant, much more allied to the common osier ; nor is this *S. mollissima* of any economical use. He received the specimens with a wrong account annexed, a frequent case in the study of the economical or medical plants

The branches are erect, wand-like, round, reddish, smooth, except in a young state, when they are finely downy. Leaves alternate, on shortish downy stalks, lanceolate, pointed, slightly crenate, rounded at the base, thin and pliable; green and smooth above; silky and very soft beneath, with a reddish nerve and curved veins. Stipulæ minute, curved, toothed, hairy. Female catkins lateral, sessile, ovate, small. Scales obovate, brown, very hairy. Germen on a shortish stalk, lanceolate, rounded at the base, silky. Style short. Stigmas linear, divided to the bottom.

The catkins of this species of *Salix*, growing in the Dublin Society's botanical garden, and which perhaps is the male of the *mollissima* just described, appear together with the leaves early in March; at this time the latter are lance-shaped, some linear-lance-shaped, revolute on their edges, silkily woolly and closely downy underneath, with a prominent mid-rib, upper surface yellowish green, reticulated, with erect veins—in their more advanced state (August) five inches long, with long petioli or foot-stalks, densely downy underneath, exceedingly soft to the touch, with a prominent reddish vein, of a ferruginous green colour, and veiny—the tips of some of the leaves in both states sphacelated. Stipules cordate or cordate lance-shaped.

and large. Catkins foot-stalked, alternate, approximating, and oblong oval. Squamæ or calyx scales long, brownish black from the middle upwards, hairy and obtuse. Stamens long and smooth. Anthers red, yellow, and black—1st, red, 2d, yellow, and in their deflorescent state black. Nectaria small, obtuse or rather truncated, somewhat like little pillars. Some hermaphrodite and female flowers on this small salix—can I be mistaken? The branches are covered all over with a dense white down, as well as the under surface of the leaves, as just observed. *Wade.*

What is the Rev. Doctor Stuart's *male* plant of *arenaria* with narrower leaves noticed in English Botany?

CXVIII.

SALIX MOLLISSIMA, *Willdenow*.

Willd. Sp. Pl. 4. 707. Ehrh. Beitr. 6.
p. 101.

Foliis subintegerrimis lineari-lanceolatis sub-
tus adpresso-pilis viridibus, pilis squamarum
amenti foeminei longitudine stigmatis. *Willd.*
Arb. 349.

Affinis *S. viminali*, sed *folia* utrinque vi-
ridia supra pilis raris minutissimis adpressis
tectis, subtus pilis frequentioribus et parum
longioribus adpressis obsita et *pili* squama-
rum stylorum longitudine. *Willd. l. c.*

Leaves somewhat very entire linear-lance-
shaped, underneath covered with pressed down
green hairs, the hairs of the scales of the
female catkin the length of the stigma. TR.

Rather like *S. viminalis*, (the common osier) but the leaves are green on both sides, the upper surfaces covered with very minute scarcely perceivable pressed down hairs; underneath the leaves are more frequently covered all over with pressed down hairs and a little longer, and, besides, the hairs of the scales are the length of the styles. TR.

Willdenow examined the female plant in a living state.

Found in Germany on the banks of rivers.

CXIX.

SALIX CANDIDA, *snowy white osier.*

Willd. Sp. Pl. 4. 708. Flüge in Litt.

Charact. Ess. Specif.

Foliis lineari-lanceolatis longissimis apice obsolete denticulatis, supra pubescentibus, subtus dense tomentosis, stipulis lanceolatis petiolum subæquantibus. *Willd. l. c.*

Description.

Rami tomentosi. *Folia* 3-et fere-4 pollicaria lineari-lanceolata angusta apicem versus obsolete denticulata margine subrevoluto, supra canescentia pubescentia, subtus nivea denso tomento obducta, nervo medio prominente, venis lateralibus ob tomentum obscure prominulis. *Stipulæ* longitudine petioli vel

parum longiores lanceolatae subdentatae acutae
tomentosae ut folia. *Amenta* mascula pollicaria
cylindracea. *Squamæ* obovato-lanceolatae
margine longissime villosae. *Filamenta* alba.
Antheræ testaceae. Willd. l. c.

Ess. Specif. Character.

Leaves linear-lance-shaped very long obscurely denticulated at their extremities, upper surface pubescent, underneath closely downy, stipules lance-shaped, almost equalling the leaf-stalks in length. TR.

Description.

Branches downy. Leaves three or four inches long, linear-lance-shaped, narrow, obscurely denticulated towards their extremities, somewhat turned backwards on their margins, upper surface hoary and pubescent, underneath of a snowy whiteness and covered over with a dense down, a prominent middle nerve, lateral veins obscurely prominent on account of the down. Stipules the length of the leaf-stalks or a little longer, lance-shaped, somewhat toothed, acute, downy as well as

the leaves. Male catkins an inch long, cylindrical. Scales inversely ovally lance-shaped, with a very long shaggy substance on their margins. Filaments white. Anthers testaceous. TR.

Willdenow, who examined the male of this willow in a dry state, has not been able to ascertain its habitat.

× CXX.

SALIX FLÜGGEANA, Willdenow.—*Flügge's willow.*

Willd. Sp. Pl. 4. 709. Vill. Delph. 3. p. 784. t. 51. f. 28. *S. oleæfolia*.

Charact. Ess. Specif.

Foliis oblongo-lanceolatis utrinque acutis subintegerrimis, exstipulatis, supra glabriusculis subtus tomentosis, germinibus ovato-lanceolatis acutis. Willd. l. c.

Descriptio.

Rami teretes fusci, juniores pubescentes. *Folia* pollicaria v. sesquipollicaria oblongo-lanceolata utrinque acuta plerumque integerrima, quandoque apice serrato, margine subrevoluto, supra viridia v. pubescentia vel glabra nitida, subtus cana tomento levi induta, venis parum prominulis. *Stipulae* nullae. *Amenta* foeminea pollicaria. *Squamæ* lanceolatae, margine villosae. *Germina* ovato-lanceolata sericea. *Stylus* brevis. *Stigmata* quatuor crassiuscula. *Willd. l. c.*

Observatio.

Valde affinis *S. salviaefoliae* sed forma foliorum parum diversa, venae subtus non rugosae et stipulae nullae. *Willd. l. c.*

Ess. Specif. Charact.

Leaves oblong-lance-shaped, sharp on both sides, somewhat very entire, no stipules, upper

surface somewhat smooth, underneath downy, seed-buds ovate-lance-shaped and sharp. TR.

Description.

Branches round and brown, the early ones pubescent. Leaves from an inch to an inch and a half long, oblong-lance-shaped, sharp on both edges, for the most part very entire, after some time serrated at their extremities, somewhat rolled backwards on their margins, upper surfaces green, pubescent, or smooth and shining, underneath clothed with a light hoary down, and veins a little elevated. No stipules. Female catkins an inch long. Scales lance-shaped and villous on their margins. Seed-buds ovally lance-shape and silky. Style short. Stigmas four and somewhat thick. TR.

Observations.

It is very like *S. salviaefolia*, but the form of the leaves is a little different, the veins on their under surface not being rough, and no stipules. TR.

Willdenow examined the female of this willow in a dry state, and he informs us,

that it is to be met with in the South of France.

CXXI.

SALIX GMELINIANA, *Gmelin's willow*.

Willd. Sp. Pl. 4. 709. Fl. Ross. Pall. 2. p. 77. Fl. Sibiric. Gmelin, 1. p. 163. 19.

Foliis ex elliptico lanceolatis, subtus, sericeis apendiculatis. Arbor et duplo homine altitudine. Interdum viminibus tantum bicubitalibus, parum ramosis; quin et cubitalibus tantum inveni ad fontes amnis *Tardedsohul*, proxime ad lacum *Bitokiil Krasnocarensis* tractus.

In humili planta, rami caule fere paralleli a media altitudine exire incipiunt.

Vimineae eleganter lutea, aut et pulvere quasi ad spersa aut nigricantia, sæpe hirsuta imprimis in fœmina. Margo gemmarum miniaceus.

Amenta masculina fere sesquiuncialia, quando florent, circa medium plus tribus quartis partibus unciae crassa. Duo filamenta longa ex albente viridia, cum antheris flavescentibus. Amenta foeminea aliquanto breviora aut aequae longa, quando matura multo longiora. Germina hirsuta, sessilia cum stilo et stigmatibus duobus tenuibus bifidis. Nec fructus maturi omni hirsutiae carent.

Squamae amentorum masculorum ex atro spadiceae, in lateribus pilosissimae, foeminarum aliquanto rotundiores et obtusiores. Nectarium cylindraceum, lutescens, admodum insigne.

Folia ab initio utrinque hirsuta, inter rigorem atque mollitiem media, superne cum aetate fere glabra evadunt, tunc ibidem nigricantia, autumnio extremo longissima, firma admodum, in oris fere denticulata, superne lutea, inferne a lanuginea, ex obtusa basi longe elliptica, et tum in longum mucronem excurrentia. Dantur interdum folia semipede longiora, quae in oris plerumque integra, interdum serrata, aut varie angulosa.

Haec gallas è flavo-rubentes saepe fert.

Multum convenit huic cum *Salice* foliis subserratis oblongo-ovatis, subtus villosis, stipulis dimidiato-cordatis, *Linn. Suecic.* 805. nisi eadem est. *Gmelin. l. c.*

Leaves elliptically lance-shaped, silky underneath, and apendiculated or ending in an additional organ.

A tree twice the height of a man. Sometimes with twigs only two cubits long, and a little branched; but it has been found at the head of the river *Tardedsohul*, very near lake *Bilokiil*, of only a cubit high. In the low shrub, the branches and stem are almost parallel at a middling height, when they begin to spring up.

The twigs are of a beautiful yellow, and appear sometimes as if sprinkled with a black powder, frequently hairy, particularly in the female plant. The sides of the buds are of a vermilion colour. The male catkins are almost an inch and a half long, when in flower, about the middle better than the three or fourths of an inch thick. Two long filaments of a whitish green colour, with yellowish anthers. Female catkins somewhat smaller, but equally long; when they arrive at maturity much longer. Seed-buds sessile, hairy, with a style and 2 slender bifid stig-

mas. Nor are the capsules, or seed-vessels, when they come to maturity destitute of hairiness.

The scales of the male catkins are of a blackish chesnut brown colour, and very hairy on their margins, those of the female a little more rounded and obtuse. Nectarium cylindrical, palish yellow, very remarkable.

The leaves from the beginning are hairy on both surfaces, neither too soft nor too rigid; the upper surfaces with age become almost smooth and then blackish; at the end of autumn the leaves become very long, for some time firm, almost denticulated yellow above, woolly beneath, longly elliptic from an obtuse base, and then they run out into an extended sharp point. The leaves are sometimes above half a foot long, and for the most part not denticulated but entire; sometimes they are serrated, or furnished with various angles.

This sallow frequently produces galls of a yellow reddish colour.

Very often the sallow with subserrated oblong ovate leaves underneath villous, with semicordate stipules, *Linn. Succ.* 805. is coupled with this sallow, if not the same. TR.

CXXII.

SALIX ALBA, *common white willow*.

Willd. Sp. Pl. 4. 710. Willd. Baumz. 350. Smith. Fl. Brit. 3. 1071. Hoff. Sal. 1. 41. t. 7. 8.

HORTUS GLASNEVINENSIS. IV.

Est species maxima cum salice fragili.
Willd. l. c.

This white willow and crack willow are the largest of the species. TR.

Charact. Ess. Specif. SM.

Foliis lanceolatis, acuminatis serratis utrinque sericeis : serraturis infimis glandulosis, stigmatibus bipartitis. *Fl. Brit. l. c.*

Descriptio.

Arbor procera, cortice ramoso. Rami ramossissimi, teretes, patentes; juniores sericei. Folia alterna, brevius petiolata, lanceolata, acuminata, acutè et regulariter serrulata, serraturis inferioribus remotioribus, glandulosis; utrinque pubescentia; subtùs præcipuè sericea; juniora omninò argentea, convoluta. Stipulæ nullæ. Amenta terminalia, cylindræa, elongata, gracilia, multiflora, squamis elliptico-lanceolatis, fuscis, pubescentibus. Stamina flava, squamis parùm longiora. Capsulæ subsessiles, ovatæ, fuscae, glabratae. Stylus breviusculus. Stigmata bipartita crassiuscula. *Fl. Brit. l. c.*

Observationes.

Liber, monente Hoffmanno, in hâc specie viridis, in *S. vitellina* luteus est.

Varietatem habemus foliis majoribus, cœrulescentibus, citissimè crescentem, notatu dignissimam, at vix caractere specifico distinguendam. *Fl. Brit. l. c.*

Ess. Specif. Charact.

Leaves lance-shaped acuminate serrated and silky on both surfaces; the lower serratures furnished with glands, stigmas cloven in two. TR.

Description.

A lofty tree with the bark full of clefts or cracks. Boughs exceedingly branchy, round, and spreading; the young ones silky. Leaves alternate with short foot-stalks, lance-shaped, taper-pointed, acutely and regularly finely sawed, the inferior serratures more remote and furnished with glands; pubescent on both surfaces; underneath peculiarly silky, the young leaves altogether silvery and convoluted or twisted. Stipules none. Catkins terminal, cylindrical, elongated, slender, furnished with many flowers, scales elliptically lance-shaped, brown, and pubescent. Stamens yellow, a little longer than the scales. Seed-vessels somewhat sessile, ovate, brown, and smoothened. Style somewhat short. Stigmas parted in two, and somewhat thick. TR.

Observations.

Hoffman observes that the bark of the present species of *Salix* is green, that of *vitellina* yellow.

Doctor Smith states, that there is a variety of this willow with larger blueish leaves, of very quick growth, highly deserving of attention, but scarcely distinguishable by any specific character. TR.

Male catkins cylindrical, slender, and alternate. Squamæ pale rose colour at their extremities and almost the length of the stamina. Stamens straight and filiform. Anthers simple. Nectarium very small. *Wade.*

When suffered to grow without lopping, it becomes a very large and lofty tree; hence one of its old English names, the *ordinary great white willow tree*. It is quick of growth, and, when lopped, soon decays, according to some authors.

The wood is white, light and, tough, agreeable to burn, because it does not smoke and gives a regular heat, and, being very

white, is therefore preferred for making milk pails and butter firkins—it is also used for flooring, for chests and for boxes, and a variety of other purposes.

It is stated in Hoffman, that the bark of this willow, boiled with water in a copper vessel, will tinge wool or silk of a blood-red colour, and with the addition of a little alum, a cinnamon.

The Rev. Mr. Stone, in the *Phil. Trans.* v. 53. p. 195. gives an account of the great efficacy of the bark of this tree in curing intermittent fevers. He gathers the bark in summer, when it is full of sap, dries it by a gentle heat, and gives a dram of it powdered every four hours between the fits. In a few obstinate cases he mixed it with one fifth part of Peruvian bark. It is very remarkable, that intermittents are most prevalent in wet countries; and this tree naturally grows in such situations. Whilst the Peruvian bark was at its usual moderate price, it was hardly worth while to seek a substitute, but now its price is very high; and, the supply from South America being hardly equal to the consumption, we may expect to find it and more adulterated and dearer every year. The *white* WILLOW bark is therefore likely to become an object worth the attention of physicians, and, if its success upon a more enlarged scale of

practice proves equal to Mr. Stone's experiments, the world will be much indebted to that gentleman for his communication. The bark of *S. triandra* and *fragilis* have the same properties. A set of experiments, therefore, should be instituted to ascertain which of the species ought to be preferred.—This bark will tan leather. Horses, cows, sheep and goats eat the leaves and the young shoots. The different species of willow support the following insects: *Papilio Antiopa*, and *Polychlores*; *Sphinx Ocellata*, *Populi*; *Phalæna Quercifolia*, *Rubri*, *Lanestris*, *Vinula*, *Dismal Moth*, *Phalæna Salicis*, *Phalæna Bucephala*, *Monarcha*, *Zigzac*, *Cossus*, Willow red under wing Moth, *Phalæna Pacta*, *Citrango*, cream-bordered pea-green Moth, *Phalæna Salicella*, bushy prominent Moth, *Phalæna Pavonia*, *Libatrix*, *Psi*, Willow beauty Moth, *Tenthredo Lutea*, *Caprea*, *Rustica*; *Ichneumon Glomeratus*; *Aphis Salicis*, *Chrysomela Polita*, *Chrysomela Sericea*; *Curculio Nebulosus*; *Coccinella 14 Guttatus*, *Cicada Cornuta*. Large excrescences are frequently found upon the branches and leaves of willows; these are the habitations of different species of *Cynips*.—Whoever should shade a walk with willows ought to set male plants only, or else they will soon multiply so as to form a thicket instead of a walk. The same observation holds good of the poplar. Bees are very fond

of the flowers. *Withering's Arrangement of British Plants* v. 2. p. 56. ed. 4. 1801.

By the chemical analysis of the bark of white willow by Vauquelin, it appears that it possesses the properties of certain species of *Cinchona* or *Peruvian bark*—namely that of precipitating isinglass, and throwing down sulphate of iron green, and acetate of copper brownish. The white willow bark therefore, as it unites the bitter and astringent principle or tastes, may without doubt answer as a febrifuge.

PROPAGATION, CULTIVATION, AND USES,

OF

Willows, Osiers, and Sallows.

WILLOWS.

“**A**LL the sorts of Willows may be easily propagated by planting cuttings or sets, either in the spring or autumn (but the spring is the best season and surest) which readily take root, and are of a quick growth. Those shoots which grow to be large trees, and are cultivated for their timber, are generally planted from sets, which are about 7, 8, or 9 feet long; these are sharpened at their larger end, and thrust into the ground two feet and a half by the sides of ditches and banks, where the ground

is moist, in which places they make a considerable progress. This is the usual progress now practised in most parts of England, where the trees are cultivated, as they are generally intended for present profit; but, if they are designed for large trees, or are cultivated for their wood, they should be planted in a different manner; for those, which are planted from sets of 7 or 8 feet long, always send out a number of branches towards the top, which spread, and form large heads fit for lopping, but their principal stem never advances in height; therefore, where regard is paid to that, they should be propagated by short young branches, which should be put almost their whole length in the ground, leaving only two or at most but three buds out of the ground, and, when they have made one year's shoot, they should be all cut off, except one of the strongest and best situated, which must be trained up to a stem, and treated in the same way as timber trees. If these are planted with such design, the rows should be eight feet asunder, and the sets four feet distance in the rows; by planting them so close, they will naturally draw each other upwards, and, when they are grown so large as to cover the ground and meet, they should be gradually thinned, so as the last to leave the

rows about 12 feet asunder and the plants in the rows eight. If they are so treated, the trees will grow to a large size, and rise with upright stems to the height of forty feet or more.

When these cuttings are planted, it is usual to sharpen those ends to a point, which are put into the ground, for the better thrusting of them in; but the best way is to cut them horizontally just below the bud or eye, and to make holes with an iron instrument in the ground, where each cutting is to be planted; and, when they are put in, the ground should be pressed close about the cuttings with the heel to settle it, and prevent the air from penetrating too deep into the ground.

The after care must be to keep them clear from weeds the two first seasons, by which time they will have acquired so much strength as to overpower and keep down the weeds; they will also require some trimming in winter to take off the lateral shoots, which, if suffered to grow, would retard their upright progress.

Willow pollards, it is well known, are planted with great profit, by the sides of

brooks and rivulets, and might, in many others, be planted with equal benefit.

An error, too frequently committed in planting willow poles or pollards, is to set them within the banks of the rivulet or brook. The proper situation for them is some feet, not less than half a rod, from the brink of the channel. The roots soon reach the moisture, and afford shade to cattle in hot weather without danger to themselves, or injury to the channel or its bank.

It is generally imagined, says Doctor Anderson (*Essay* 1. 78.) that the willow can be made to thrive no where except in wet or boggy ground. Experience has sufficiently convinced him, that it will not only grow, but thrive, in any rich well cultivated soil, even although it be not of a very wet nature.

He recommends it as a fence for dividing any extensive field of rich ground into separate inclosures. For this he advises to mark off the boundaries in winter, or early in the spring, in order to give a complete fallow to a ridge 6 or 8 feet broad, in the middle of which the hedge is intended to be planted the ensuing winter. Plough it frequently

during the summer ; and in autumn manure it well with dung, lime, or both, and form it into a ridge before winter.

Be provided with a sufficient number of plants previously reared in a nursery as near the field to be closed as possible ; for, as they are very bulky, long carriage will be expensive. Plant in winter as early as conveniently can be done. All the large kinds of hoop willows may be used for this purpose ; but there is a sort with stronger and more taper shoots, covered with a dark green bark when young, which, upon the older shoots, becomes of an ash grey, of a firm texture, and a little rough to the touch : the leaves are not so long as, but much broader than those of the common hoop willow, pretty thick, and of a dark green colour. This becomes very quickly of a large size at the root and, being strong and firm, deserves to be preferred for this purpose.

In the 5th vol. of the Farmer's Magazine—it is observed, that either the *red** or *white willow*† will grow well in all fenny situations, moor or moss, or wet or low lands, or any kind of clay, loam, or mixed soils,

* *Salix fragilis*, p. 109. † *S. alba* p. 400. or *triandra*? p. 6.

but should never be planted on any high, dry, or burning lands.

These are always planted for cuttings or boughs, commonly of four years growth—the sets have frequently the tops cut off, and are left about 8 feet long; but before planting they should have the thick end put in water 3 or 4 weeks, which makes them grow the better. When the planting season arrives, holes are dug about 2 feet deep, and at 9 or 10 distance—the sets are then put in, and the holes filled up with earth. After the sets are planted, if the weather be very dry, they should be watered sometimes during the first year of their growth. Such plantations should be either fenced in, or stock kept from them for a few years, till they are covered with a coarse thick bark, that stock will not eat. Those, which were topped before planting, should be cut every four years, when they will produce many sets to plant fresh fields, or valuable wood for other purposes.

But it is a most excellent plan not to cut the tops off the sets, when they are planted, but to let them grow for timber, and only cut the side boughs every 4 years for sets, &c. These willows will grow in

most situations more rapidly than any other wood, and to a prodigious large size, even as large as oaks or elms. The wood is very tough and durable, when kept dry or pointed, and is valuable for building and other purposes. The author of the preceding remarks states that there is a proverb in the Fens of Lincolnshire, “that a willow will buy a horse, before an oak will buy a saddle.”

In the 6th vol. Repertory of Arts, first Series, p. 127, Observations on the planting of waste lands, taken from the Memoirs of the Literary and Philosophical Society of Manchester,—

Mr. Richardson the author makes some very judicious remarks—he states, that the *willow* will grow luxuriantly in marshy ground, and its produce is great and lasting. He observes, that there are many species of the genus *Salix* annually cultivated for various purposes; but, upon the whole, the three following species only are recommended to the planter as entitled to notice or preference.

Salix alba, (the white willow.)

—— *caprea*, (the sallow.)

—— *viminialis* (the osier.)

These three are in the greatest esteem, and applicable to every use, for which trees of this genus are commonly employed.

Of the *white willow* (*S. alba*)—Mr. Richardson tells us of a small plantation on a swampy piece of ground in the year 1761, which grew so luxuriantly, that the fairest of these trees were cut down in 1786. One of them measured, at 5 feet from the ground, 6 feet 5 inches; and, at the length of 32 feet, 4 feet 7 inches in circumference. There remained standing about 90 of the smallest trees, which were then thought unfit for cutting, having been robbed of their growth by the shade of the others. The best of the trees was measured at the time the others were cut, viz. in 1786—it was only 3 feet 10 inches in circumference, at 6 feet from the ground. It was again measured in 1793, at the same height, and it was no more than 4 feet 4 inches.

This circumstance Mr Richardson mentions, to show the slow progress made by this tree in the last 7 years, compared with its growth in the former 25 years under the disadvantage of being choaked up and crowded by its more luxuriant and lofty

neighbours; a fact affording full proof of the quick attainment of these trees to perfection.

The wood from its peculiar whiteness is in high estimation, and bears a good price for butter firkins, milk pails, casks for liquors, boards for flooring, chests, boxes, and various kinds of husbandry; it is also excellent for the tilts and sides of waggons, being very light, and yet exceedingly tough and pliable.

The *sallow* (*S. caprea*) is a very quick growing tree and extremely useful, where new enclosures are to be made either for the improvement of land, or raising plantations, as it makes good stakes for hurdles.

Mr. Richardson cut down one of these trees in the winter, from the stool of which, in the following autumn, a numerous offspring had arisen, some of which had shot out to the amazing height of 10 feet. In the spring of the preceding year, having occasion for some hurdles to protect a young hedge of hawthorn just planted, he cut down these shoots for stakes; they were something too slender, but answered the purpose tolerably well. He observes, that no wood burns clearer,

with a lighter flame, or for a greater length of time; that this sallow is even preferable in this respect to the beech; it emits little smoke, and is extremely sweet and wholesome.

Mr. Richardson adds an interesting account of the *bark* of this plant in its green state—15 reams of strong paper being made from it. It appears from the testimony of the maker, that the paper made from ropes sold at that time (1798) at eight shillings and sixpence the ream, but that paper made from the bark of the willow may be sold, with equal profit, at 5 shillings and eight pence the ream, and that pasteboard for book-backs, made from ropes, sold at £25 per ton, long weight of 120 pounds to the hundred; but pasteboard of the same thickness, made from willow bark, may be sold at £17 per ton.

In the 5th vol. of the same work, second series, p. 204. On the cultivation of willows, by Mr. Lowe.

He advises the laying out the ground into lands, like hop-lands, viz. from 3 to 4 yards wide with a ditch on each side, 3 feet wide at the top, 1 foot at bottom, and

$2\frac{1}{2}$ deep. The earth, that comes out of the ditch, should be thrown on the land. But, if there is not a full and sufficient fall for the water to get off, the ditch should be deeper, and wider, till you have near a yard of earth above the level of the water. As soon as this is done, the ground must be double dug—viz. trenched 2 spades in depth, except your ground be very boggy, which will afford room for the plants to shoot, and will save the expense of weeding, which otherwise must be incurred in the first summer after the plants are set; for, if they are not kept clear of weeds the first year, the hopes of the planter will certainly be destroyed.

The willow Mr. Lowe recommends on every account is the *broad-leaved red-hearted Huntington-shire* * willow, as he calls it—every other species he tried, and he finds reason to give a decided preference to this.

He advises the sets or truncheons to be cut from 20 inches to 3 feet long; particular care should be taken in the cutting, that the bark should not be *fridged* or bruised,

* *Salix fragilis*, *Russeliana*, or *triandra*? p. 109. 18. 6.

or in other respects injured; for in that case the plant will be weak and puny. They should be cut on a block, but on the land, obliquely and with a very sharp bill or instrument. They must be dibbled into the earth by an iron crow, to the depth of 14 or 30 inches, so that not more than 6, or less than 4, appear above. If the truncheon should not fill the hole, the earth must be trampled close round it, in order that the air may be excluded. Care must be taken, that the plant be set as the pole grows. The cuttings should be from poles of about 4 years growth. Maiden poles are the best; they should be set 3 feet asunder in quincunx form.

Those truncheons will shoot out many branches, 2 or 3 of which will grow to poles, if the land is good, if not, only one. Those poles have sold at 8 years growth for £214 per acre, neat money; the kids, or brush wood, pay for the felling. Had he suffered them to have stood 2 years longer, they would have produced £300 an acre. Should any of the plants look weak or puny, or not shoot vigorously, it will be necessary to dig in a skuttle full of manure to the roots.

Though Mr. Lowe planted no less than

10 acres, he cannot positively say, from his own knowledge, what the value would have been, had they remained on the ground for 15 or 20 years, having being called on for sets by the gentlemen of the neighbourhood, which he sold for £3 a thousand. Mr. Lowe observes that the stools, whenever the sets are cut, shoot very luxuriantly, and will produce from 3 to 4 poles.

The length of the poles, at 8 years growth, were from 33 to 36 feet, and most of them were large enough to make 3 rails, at 2 at the bottom, and 1 at the top; but the great use, to which they are applied, is for the purpose of making hurdles, stakes, gates, and other farming utensils, being a wood uncommonly tough and light, owing, as he conceives, to a new method he made use of in planting them close to the ground. If it is the design of the planter to grow it into timber (which Mr. Lowe would venture to say would be far superior to *deal* for the purpose of flooring or other light work, particularly as it will neither splinter nor fire, and, if suffered to remain for 20 or 25 years, would make good masts for small craft, as they shoot up perfectly straight, and without any collateral branches) it is necessary, at the first or se-

cond year's growth, to observe which pole is the strongest, as the remaining poles must be cut away. In about 15 years, he is led to suppose, they will want thinning: of course, the inferior must be taken out, and the superior be suffered to remain.

The times of planting must be from January to the end of March; but the sets for that purpose should be cut from December to the end of February, when the sap is down. And the reason is, that, if the poles are cut in the spring (the sap being up), the stool will at last be weakened by bleeding, if not killed, and of course prevented from shooting so vigorously as if cut at the preceding time. If, however, there are people so injudicious as to sell sets in spring, it will be to the advantage of the purchaser to plant them, as the sap is then in the poles. The reason, why many are induced to cut poles at that time, is on the supposed account of their peeling better; but Mr. Lowe can affirm from experience, that poles cut in December, January, and February, and laid in rows upon the ground or the ends put in water, will peel as well in the spring as the usual time.

In regard to fencing, planter should pay the greatest attention to it, otherwise his time and expence will be fruitless.

OSIERS.

IN order to raise a bed of Osiers, the ground being properly dug over or ploughed, cuttings must be procured of two years wood, though the bottom parts of the strongest one year's shoots may do; they should be two feet and a half; a foot and a half to be thrust into the ground, and the other foot to remain for the stool: put them in at two feet distance every way. The first summer the weeds must be kept under, and the next the tallest must be hacked down. In three years the sets should all be cut down to the first planted head. They will sell well to the hurdle-maker; and there will be a regular quantity of proper stools for an annual crop of twigs.

If osier holts are over-flowed by the tides, the rows should go the same way with the stream, and should be at a greater distance from each other, that the weeds &c. may have free course; in this case the cuttings may be planted closer in the rows.

Plantations, designed to be cut every 6 or 7 years for poles, may be raised in the same manner, only that the cuttings must be a yard asunder; but, when intended for hurdles, the distance need not be so great.

For timber, the cuttings should be of the last year's shoot, a foot and a half long, a foot of which should be thrust into the ground; they should be planted at the distance of three feet every way. The end of May, or beginning of June, the sets, that have shot too luxuriantly, should have all the branches removed, except the leading shoot.

The osier, says Mr. Marshal, in low moist situations may be cultivated on a small scale, at least with great advantage to every farm, for binders, thatching rods, hurdles, edders, stakes, rake and scythe handles, &c. and for poles and rails of almost any length.

The first step is to throw the soil into beds, so as to lay the surface sufficiently dry; the osier disliking an unsound situation.

This work should be done in autumn; and in March following, these beds being firmly established and their surfaces in good working order, the soil should be thoroughly trenched with the spade, and truncheons inserted.

Put in the sets two feet from each other, dibbling in a potatoe plant between them. During the summer keep the surface clean-hoed and the potatoes earthed up.

In autumn, after the potatoes are taken up, draw the soil towards the roots of the plants, leaving channels between them to carry off the winter's rains. The ensuing spring look the plants over, and replace such as have failed with fresh strong shoots.

After this, little more will be necessary than to keep down the taller weeds: if, however, the plants do not overcome the weeds in the course of 3 or 4 years, they must be cut down to the stub, the spaces dug, the rubbish turned in, and the roots of

the plants freed from incumbrances with the hoe.

Notwithstanding the osier is usually planted near water, it affects a sound, if not a dry soil. The places it most delights in are drained moors, and the banks of large rivers, both peculiarly dry situations; it has no dislike to being flooded occasionally, but seems to be invigorated by such irrigation: the sand banks therefore, which are frequently thrown up by the sides of rivers, and sometimes lie for half a century before they become profitable, are peculiarly eligible to be converted into osier grounds.

The method of planting an osier ground is this; the soil being laid perfectly dry, and its surface made clean, cuttings of the second or third year's growth, and about 12 inches long, are planted in drills, about two feet and a half asunder, in the month of March. The cuttings ought to be thrust in 7 or 8 inches deep, leaving 4 or 5 inches of head above the ground.

The intervals should be kept stirred with a small plough, or the first year a crop of potatoes may be taken; the drills in either case must be kept perfectly clean with the

hand hoe ; and, at the approach of winter, the intervals should be split, and the mould thrown to the roots of the young plants, to lay them dry and warm during the winter. The following spring, the first year's shoots may be trimmed off, and the plants, which have failed, must be replaced.

The second summer, the intervals must be kept stirred, the drills hoed, and the plants earthed up, as before, against winter.

The ensuing spring, the stools must again be cleared, although the twigs as yet will be of little value. But at the third cutting they will produce marketable ware, and will increase in quantity and value, until the profits arising from them will be very great. In situations, which the osier affects, and in countries where the twigs are in demand, osier grounds have been known to pay an annual rent of ten pounds an acre. Under ordinary circumstances they will, if properly managed, pay four or five. *Planting woodlands*, v. 1. p. 183. to 187.

In the 5th vol. of the Farmer's Magazine, p. 182—it is observed, that in the fens of Cambridgeshire many holts (as they are principally called) or plantations of osiers

are raised, which beautify the country, keep the stock warm in the winter, and provide much useful wood for baskets, cradles, and all kinds of wicker work, and also for cribs for cattle to eat straw or hay in, and to make staves or hurdles to fence in stacks, part lands &c. &c. or they make hedges, that will last 4 years well, and, if allowed to grow 5 years, many of them would make good fork-shafts for hay or corn.

The holts, or plantations of osiers, are commonly made in the middle of the land in the North and East corners, and sometimes at an end, side, or place, that appears most easy, or in any respect the most desirable.

The situation and size of these holts vary exceedingly: sometimes they are made, in the middle of the lands, from 10 to 60 yards square; and in others, in the sides or ends, from 1 yard wide to 10, and from 10 to 100 yards long.

The mode of planting is very simple—first to dig the land from 6 to 12 inches deep, and then to prick down the cuttings of 4 years growth and 18 inches long, at about 3 feet distance from each other. The soil should be moor or clay, or any that is

low and wet; if drowned half the year, it will be but little the worse.

These holts or osier plantations must be fenced round, either with dikes, which is most common, or with hedges, as is most convenient. The proper season for making them (though they seldom fail of growing at any time) is from the fall of the leaf till very late in the spring, and the sets are very cheap. Such plantations are cut annually for baskets, steps, scuttles, cradles, and all kinds of wicker work; but, where the osiers are kept for sets, or to make hedging wood, or staves, or hurdles, they are cut only once in 4 years.

In the 6th vol. of the same work, page 207—it is stated, that the principal errors, into which most persons fall who attempt to establish plantations of osiers, proceed from the following causes—employing improper soils, peat earth, perhaps, or poor bog; imperfect or perhaps no preparation of the soil, though proper in other respects; bad or useless sorts planted—too few cuts put into the ground—want of culture, particularly during the first spring and summer after planting, allowing the shoots to be cut over after Christmas and before the middle of March,

which may be the cause of the stocks being weakened by hard frost, succeeding heavy rains immediately after the twigs have been cut, and before the wounds from the knife are healed up. If it is expected to rear the finest and most valuable twigs, the land must be cured of chilling, weeping springs; and, if the soil is not of considerable richness, it must be made so with manure. Moderate moisture is favourable to the production of fine trees, but water *continually stagnant* may be considered as ruinous. It may also be necessary to trim and dress the stocks from decayed wood, and to leave only as many buds on each, as you think the plant will bring to good perfection in length and strength of shoot—cutting down the superabundant stumps to the old wood—extirpating the weakest shoots or stumps—and seldom leaving more than 2 buds or eyes on those you make choice of to stand to produce next summer's growth.

This operation should be performed in November or December, or in the end of March or beginning of April; going over the plantation with a strong sharp pruning knife, examining every stock with attention, and trimming it to the best advantage.

All this can be done for a trifling expense, if the stocks are trained from the beginning and regularly and carefully trimmed every time the plantation is cut over. Instead of a number of weak shoots and small, the largest probably little above 4 feet long, as may be observed in plantations, where no attention is paid to training and trimming the stocks, or pains taken to keep down weeds and grass by careful and regular hoeing; by pursuing a different and opposite management, they become from 4 to 9 feet long, and of the best quality. Where any plants have failed, their place should be carefully supplied; that is, next season, as soon as the plantations are cut over. Pieces two feet and a half long may be used for cuts, allowing 18 inches to remain above the ground, to secure air and head-room during the following summer. Indeed greater length of the rod put in would afford these advantages still more considerably; but it is conceived the superior power, that would thereby be given to the winds to agitate the roots, would counterbalance the benefit of the additional air and head-room, which by this means might be obtained.

Some observations, *On making Plantations of Osiers* by Mr. Phillips, of Ely in England,

in the *Repertory of ARTS*, Vol. xi. 25. first series, taken from the *Transactions of the SOCIETY for the Encouragement of ARTS MANUFACTURES, AND COMMERCE*, and for which he received the silver medal are worthy of being noticed.

He made many experiments on different soils, with a view of ascertaining which are most appropriate to osier plantations, and which of the almost infinite variety of osiers are best adapted to different soils; but, as Mr. Phillips's plantations were chiefly in the fens, he directed his attention more particularly to determine, what species of osiers are most profitable in a black peat soil, and which is the most advantageous way of planting them, and at what season of the year. He regrets, that we have no specific terms for the most useful, and he endeavours to give a plain vulgar account of those only, which are selected by the most experienced planters in his neighbourhood. He has endeavoured to reduce the different varieties of osier into two classes—first those, which are called so by the growers and basket-makers, distinguishable by their more blunt mealy or downy leaf—and, secondly, those, that have a leaf more pointed, smooth, and green. Of the first class, he has 9 or 10

varieties, all of which he has eradicated except one, which is called the *grey* or *brindled osier* *. It has, in common with the others, the light coloured leaf, but is known by having its bark streaked with red or blood colour—he observes that it has not been long introduced into England—it grows vigorously, is very hardy and tough, and bleaches well—he states, that all others of the first class delight in a wet soil, and will flourish even in the most barren kind of peat; but they are coarse and spongy, have a large pith, are brittle, and very perishable; they are, however, used sometimes for the stouter parts of large baskets, and, unpeeled, for hampers. They grow quick and large, and a small number will fill the ell bunch, by which all osiers are sold in England, but are profitable to those growers only, who live near London, or whose plantations are contiguous to water carriage.

Of the second class are,

1. The *Welch* †, both red and white; the red having the preference, and being said to

* *Salix acutifolia*? p. 94. *Wade*.

† *Salix purpurea* and *Helix*? p. 127, 132. *Wade*.

have been brought from Wales originally: they form an almost essential part of every plantation, as no other is fit to tie the bunches, after the rods have been peeled and whitened. A bunch is formed by compressing the osiers in an iron hoop or band, of all ell circumference. Eighty bunches make a load, which about the year 1795 sold at £18, and about four years afterwards was worth only £12. The best land will produce a load on an acre, but half a load is not a very bad crop on bad land. The Welch are also used to tie reed sheaves for thatch; they are so bitter, that cattle will not browse them unless driven to the extremity of hunger, and rats will not touch them, although they will destroy almost every kind of bandage. They were formerly grown for the coopers, to bind their hoops: but, for this use they have long given way to the hazel; they are very tough and durable, and would rank with the best sorts for the use of basket-makers, were they of a better colour when peeled.

2. The *West Country Spaniard*. It is supposed to have been first introduced into the West of England from Spain. It is very different from the *Spaniard*, which is a species of the larger willow, and used for hedging-wood and hurdles. In the Isle of Ely it

was long in high estimation, until others were introduced, supposed to be superior in some of their qualities: its bark is of a bluish grey colour; it grows stout and stately, and objects to no soil; the grower, however, urges against it what he thinks to be a strong objection, *viz.* that it produces a small crop, as it bears comparatively only a few shoots on a head; this is certainly true; and it is consequently less profitable, provided only an equal number be planted on an acre with those, that bear more shoots. Mr. Phillips' experience teaches him, that an acre of land will carry, of this sort, 14,000 plants with more ease than 12,000 of the best new kind.

3. The *new kind**. Mr. Phillips has not been able to learn where this kind originated. He states, that it is well known every where: and, although it must be much older in some countries than others, it is universally called by that name. There are however, he observes, two sorts; the other is called the *last* or *best new kind*.† The bark of the former is of a light brown colour; that of the latter

* *Salix rubra*? page 147. *Wade*. † *Salix Forbyana*? page 143. *Wade*.

resembles rusty iron, with longitudinal stripes: it is on that account called by some persons *Corderoy*. When the new kind was first introduced into the Isle of Ely, it soon expelled most of those of the first class. The few retained are used by the fishermen to make grigs, or twig tunnels, to catch eels and other fish: it still retains considerable reputation, but yields to the *last new* kind, which, besides possessing most of the best properties, produces, on an average, at least four shoots on the head more than any other, and will grow well in a dry mellow ground. As its shoots are more numerous, a greater space should be allotted to it, to draw nourishment from the earth, and to admit the rays of the sun and circulation of air, so necessary to the growth of every plant: 11,000 an acre is quite sufficient on good land. But the best of all, considered in a public or political view, is,

4. The *French* *. Under this name Mr. Phillips observes the *Ground-setter* is frequently sold; and he is informed, that it was so called from its tendency, when neglected, to direct its shoots amongst grass

* *Salix Helix?* and *Salix purpurea?* p. 127, 132.

and weeds, parallel with and near the ground. It is of the same quality, colour, and appearance as the French, except that it has at the point a tuft, formed of leaves curled inwards, which has the appearance of a small withered rose bud—both of them are easily known from all others, thus: draw them through your fist from the top to the bottom, and the leaves will snap off with the brittleness of glass. The *Ground-setter* grows very slowly, and is rejected by the planters on that account. The *French*, although more luxuriant, is also comparatively of slow growth, and it requires a great number to make up the bunch; but it is exceedingly taper, pliant, close-grained, tough, and durable. The basket-makers are more desirous of it than of any other; it being best suited to make the smaller and finer baskets, hats, fans, and other delicate articles. As it is much disregarded by the planters in England, the basket-makers, in times of peace, have imported vast quantities from France, the Austrian Netherlands, (Belgium) and Holland, where it is cultivated with great success. It is singular, that it should be imported cheaper than the planters in England can afford to grow it; lands in France and Holland are much dearer than the fens in England. As an article of com-

merce or as a raw material, it deserves every encouragement, that the public or individuals can give it; and, if be not so profitable to the grower, it is always of a ready sale.

Mr. Phillips has heard of another sort, which is well spoken of, called the *Red Kent Willow*.

As to the most advantageous way of planting, there is some difference of opinion. The different qualities and situations of soils are not always attended to—we are often deceived by a single experiment—what may hit or fail one year, may be the reverse the next—it requires a diversified series of experiments, to enable us to form a right judgment.

Mr. Phillip's plantations of the year 1794, made on banks of soil thrown out of the ditches on each side, and these made on the level ground, flourished equally well that year. It was difficult, he observes, to judge of them the next year; for they had been more or less injured by the vast inundation of all the fens of the Isle of Ely, and which was not removed in many places until late in the summer; but in the third year

the advantage was manifestly in favour of those, which had been made on banks or elevated beds.

In the district of Ely there are from 10 to 14 inches of vegetating mould, or soil on the surface; immediately beneath it is a black or brown barren peat, of a loose texture. In the drought of summer, when the moisture is exhaled from the upper and more tenacious soil, the water instantly filters through the peat, and leaves the plants destitute of their best nourishment; but, when the peat is thrown upon the solid earth, it will prevent the rays of the sun from penetrating to the bottom; and, when the water falls in the ditches, the lower and more tenacious soil will retain a sufficient quantity of it for the use of the plants. Care should be taken to insert the sets through the peat into this lower stratum: they will strike their radicles the first year into this more solid earth; but, when the peat has been meliorated by the sun and air, and been compressed and become more adhesive, they will strike higher in the stem, until the radicles approach the surface. It must be admitted, that this is an expensive method, and lessens the quantity of land to be planted upon. To re-

medy this inconvenience, Mr. Phillips lays out his lands in beds or barrows of 18 feet wide. Ditches, of 9 feet wide, are dug on each side, the top of which, 14 inches thick, is laid on the barrows.

The beds or barrows, now consisting of about two feet and a half thick of solid earth, above the surface of the peat, are planted the following autumn and produce good crops. When the water is sufficiently low, Mr. Phillips casts upon these beds a fetid vegetable substance, called *Bear's Muck*. It resembles wet shag tobacco, and lies under the peat; it is extremely useful to the plants; and, although it is, in its primitive state, a perfect *caput mortuum*, when exposed some time to the air it putrifies, affords mucilage, and becomes a good manure. In embanked districts, subject to frequent and long inundations, two other advantages are obtained from these raised beds: the osiers are thereby removed farther from the reach of the ice, which, on a thaw, floats into the lower plantations, and does much injury; and, when the waters are high in the cutting or planting season, the beds are more accessible than the level ground; but, having had the command of the water, last summer, by a mill or engine,

Mr. Phillips dug out the peat into turf, having first laid aside the upper spit; the turf being removed, he returned this spit into the ditch, and planted upon it, and thus no ground was lost.

In the year 1796, Mr. Phillips made an experiment on an acre of land of this quality—he ploughed one half of it, and the other half was dug with the spade about 14 inches deep; the sod of that thickness was inverted by the spade. The plantation on the ploughed land was very weak, and failed in many places; that which followed the spade did better; but they were both so bad, that he renewed them the next year. On the former, the best land lay uppermost, which, when deprived, by heat, of its moisture, derived no assistance to support the plants from the peat, that lay underneath: on the latter, some of the best land was laid in the ground, but not deep enough to retain moisture in sufficient quantity. The preceding year he planted, in a piece contiguous, on banks as before described; and there the osiers did well.

On a rich loam, lying on a bed of potter's clay, the situation low and exposed to water, French osiers were very scarce, and

Mr. Phillips could procure but a few hundreds; he laid them down in their whole length, and pegged them on the ground; they struck good roots into the earth, and threw out abundant shoots.

This experiment, together with that of planting upon banks, Mr. P. observes, will enable us to answer the question often asked, "Of what length ought the set to be?"—It depends entirely upon the nature and situation of the land. There should be so much of it in the ground as to enable it to procure moisture; and so much of it out of the ground as to make it accessible in the cutting season. Where much weeding is not necessary, where there are no floods, or where they subside quickly, there ought to be very little of it out of the ground. The nourishment, in that case, will pass immediately from the roots to the rods or shoots, without the burden of first supplying the head or stock.

Every experiment that Mr. P. made confirms his opinion, that the autumn, and not the spring, is the most proper season for planting. Those, who think with him, say that the fall of the leaf indicates the proper time to cut the sets—it is certainly so in general; but the leaf of the osier, like that of the oak and other trees, will sometimes

prolong its departure. The stagnation of the juices is the true criterion, by which to judge; not on account of the set, but of the trunk, lest, if you amputate it whilst the juices are in circulation, it should bleed to death. Mr. P. planted in the first week in October, and the sets appeared to remain torpid for the remainder of the year; about Christmas he took up several of them, and was much pleased to find that they struck root, although they had given no outward appearance of vegetation from the time of planting. He observes, that it is probable the earth retains a sufficient portion of the summer heat until the autumn, to give life to the plants at the root, when the atmosphere may at that time be so cold as to discourage any exertions above ground: and perhaps nature may be more vigorous, when her operations are confined to one point.

When you plant in spring, the set seems (figuratively speaking) to have its attention distracted by two operations not very homogeneous, the one upwards, the other downwards. It is impelled to shoot its radicles into the earth, to form its stability, and procure sustenance; and it is called upon, at the same time, to put forth its leaves and branches. To speak without a figure, says

Mr. P. the prolific sun and air induce it to exhaust the juices, in extending the shoots, before the roots are sufficiently strong and large to supply the drainage; hence it is that, contrary to the commonly received opinion, a warm or dry spring is always injurious to the young plantations. If there be not sufficient rain to convey sustenance by the leaves and bark, in aid of the small quantity procured by the roots, the plant must die or dwindle; and it is very observable, that the first vigour of the late-planted set is a sure prognostic of its decline or dissolution. In the autumn of 1795 Mr. P. made a small plantation, and on the remainder of the piece he planted in March following. In the beginning of May, those last planted were the most forward, which, for a time staggered his opinion of the most proper time for planting; but, in June, those planted in the autumn had much the advantage, and continued to grow well; those, that were set in the spring, decayed in summer, and many of them died. Where the fibres have been formed before the winter, or when a tendency to form them has been observed, by the swelling of the bark, and particularly at the eye, the plant is enabled to charge itself with a sufficient portion of the juices to answer the demand of spring.

The rule therefore, which Mr. Phillips lays down, where no obstructions are raised by the water, is to plant as early in the autumn as the sets can be cut, without endangering the parent stock.

In the 24th, vol. "Transactions of the Society of Arts," Mr. Wade, of Benhall in Suffolk, who obtained the silver medal of the Society for planting 15 acres and a half of osiers, with upwards of 12,000 cuts to an acre, makes the following remarks.

The names given to osier plants cultivated in Suffolk are *new green osier* *, *leathering osier*, *French rod*, *notely red*, and *cranecker*. The plants are usually set at a distance from each other of 26 inches by 10, and are found to grow best near rivers. The expense of sets 9 inches long he computes at about £10 an acre besides an additional expense of two guineas for preparing the land, in ploughing, harrowing, and in planting the sets. He thinks a greater profit cannot reasonably be expected than £10, an acre; for the plants, he observes, are very subject to the depredations of insects, and are

* *Salix rubra*, vel *Forbyana*? pages 147, 143. *Wade*.

particularly injured by a brown bug, which is followed by a black caterpillar, which makes them crooked, and entirely kills the top; besides this, new sets are continually wanting—so much injury has accrued to one plantation belonging to Mr. Wade from the prevalence of this insect, that he was obliged to stub up all the osier plants, and, after cleaning, reset it with fresh ones. He holds it absolutely necessary to keep the beds perfectly free from weeds for the first two years.

He further observes—that the cultivation of the osier has been found to be very profitable on low lands, which, from being overfluid by floods, are often incapable of being applied to other uses, from the stagnant water converting them into a kind of swamp. On plots of ground of this description nothing else can be advantageously cultivated. It is necessary, however, to plant the osier on beds intersected by very deep trenches, the earth out of which should be from the beds, by which means the plants will be raised above the constant standing of the water, and will grow more luxuriantly.

The expense of planting in the first instance is certainly great; but, as the crop

may be cut every year, it will in a short time be amply compensated.

SALLOWS.

SALLOWS are commonly planted in cuttings made from strong shoots of the former year, about 3 feet long; these are commonly thrust two feet deep into the ground, and one above it. The cuttings should be placed above 5 feet, row from row, and two feet asunder in the rows, observing always to plant the rows the sloping way of the ground (especially if tides overflow the place;) because, if the rows are placed the contrary way, all the filth and weeds will be detained by the sets, which will choak them up.

The best season for planting these cuttings in the osier grounds is February; for,

if they are planted sooner, they are apt to peel, if it proves hard frost, which greatly injures them. The plants are always cut every year, and, if the soil be good, they will produce a great crop—however, they thrive well upon moist boggy soils, upon which few other things will thrive.

In the 11th, vol. of the Bath Papers, p. 23—it is observed, that *Sallows* are calculated for the division of low, moist lands with considerable advantages.

Mr. Pugh in the 7th. vol. Bath Papers p. 324, observes that in the thickening woods, or new planting coppice woods, he prefers the horse chesnut, with what he calls the *black withey** to any other kinds of wood, from the quick growth of the latter, and from the little experience he has had in his own woods; he says it may be cut down every 7 years for faggots, at which time they will make very good ones. He has had specimens of the *black withey* at one year's shoot 10 feet, and at 4 year's growth near 6 inches round—this *black withey* makes the best hedge stakes, that can be used, because they are straight and handy, and will all grow, whereas

* *Salix caprea*? page 349. *Wade.*

all the other stakes, in 3 or 4 years, rot and become useless, and a temptation to hedge-breakers.

Suppose, says, he in planting the seeds of the horse-chesnut and the cuttings of the *withey*, and planted alternately, allowing 6 feet every way, which would allow of sufficient space. The cuttings of the *withey* to be about 6 inches long, to be set 4 inches in the ground, and 2 out, and the chesnut in the third year, suppose the beginning of March, to be cut down within 2 inches of the ground; it will throw out 4, 5, or 6 shoots or off-sets, as the spring advances, and increase after every felling.

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